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CONTENTS Page 1. **INDEX TO ADVERTISEMENTS Page 2.**

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THE INTRAMUSCULAR OR SUBCUTANEOUS INJECTION OF NEO-SALVARSAN.

BY

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THE intravenous administration of the arsenical compounds which are now used for the treatment of syphilis is hedged around with many obvious difficulties which seriously limit their use. It is true that certain compounds, such as neo-salvarsan and substitutes, galyl, and luargol, can be administered in concentrated solution with comparatively little trouble, but the precision demanded by the operation and the odd chance that the patient may display alarming symptoms immediately afterwards are deterrents to the practitioner carrying out these injections in his private consulting-room. It is clear, therefore, that if the hypodermic method proved therapeutically as effective as the intravenous, and could be freed from the disadvantages of local pain and reaction, it would simplify the arsenical therapy of syphilis and extend its use.

Previous to the investigation detailed below there were some grounds for supposing that the hypodermic injection of neo-salvarsan might prove therapeutically more effective than the intravenous injection of salvarsan. For example, (*a*) Wechselmann and Eicke[1] have stated that they can effect more with deep subcutaneous injections of neo-salvarsan than with intravenous injections of salvarsan, though we cannot remember any publication in which the point has been proved by statistics. (*b*) Various workers have indicated their impression that when the perfected salvarsan of to-day is given intravenously it is too quickly absorbed and excreted to produce its full effect.

Thus Gennerich[2] stated that latterly he had found it necessary, in order to produce the same effect, to administer more salvarsan than formerly on account of the greater speed of excretion of the present-day preparation.

(*c*) Scholtz[3] commences his course of treatment by administering four small doses of salvarsan intravenously on the first two days, on the principle that it is not so necessary to ensure the presence of as large a quantity of salvarsan as possible in the circulation at one moment as the continuous action of some salvarsan over as long a time as possible.

(*d*) Neo-salvarsan is more soluble and quickly excreted than salvarsan, and many good authorities (with whom we agree) hold that, when administered intravenously, it is not so effective as the older preparation.

It is probable, therefore, that it is an advantage to ensure slower absorption, as would be done by hypodermic injection. It is, of course, possible with regard to the latter that if, as we now believe, the effect of hypodermic injection is better, it is because the derivative of the arsenical preparation which is produced by the subcutaneous tissues is more effective than that which results from intravenous injection.

In order to compare the effects of the two methods we have treated two parallel series of cases of syphilis (*a*) by intravenous injections of salvarsan (or "substitutes"), and (*b*) by deep subcutaneous or intramuscular injections of neo-salvarsan (or "substitutes").

The investigation was carried out in two separate hospitals, and the remedies used were (1) salvarsan, kharsivan, arsenobenzol, and arsenobillon for intravenous injection; and (2) neo-salvarsan, novarsenobenzol, and novarsenobillon for subcutaneous. Since the results obtained by salvarsan agreed substantially with those by each of its substitutes—and the same applies to neo-salvarsan and its substitutes—we have combined them in each series, and, to avoid repetition, will refer to them as intravenous salvarsan and subcutaneous neo-salvarsan respectively.

The cases in the intravenous series were as far as possible similar to those in the subcutaneous.

The best comparison between the two series would be obtained by observing them for a prolonged period afterwards, but this would be impracticable at present, and we have based our comparison on the results of Wassermann tests carried out at the end of each course of treatment. For the tests we are indebted to Captains A. Dawson and McWhirter, R.A.M.C., and to Mr. N. Clarke, Military Hospital, Rochester Row.

The treatment administered to the respective series consisted of 2.8 grams salvarsan intravenously and from 3.9 to 4.2 grams neo-salvarsan (equivalent to from 2.6 to 2.8 grams salvarsan) subcutaneously, as shown below. In addition, seven injections of mercury at weekly intervals were administered to every case.

TABLE I.—*Cases Treated and Doses.*

Days of Treatment.	Intravenous Salvarsan Series. Doses of Salvarsan in Grams.	Subcutaneous Neo-salvarsan Series. Doses of Neo-salvarsan in Grams.
1st	0.3 to 251 cases	0.45 to 139 cases; 0.6 to 23 cases.
4th	0.3 "	—
8th	0.3 "	0.45 to 99 cases; 0.6 to 62 cases.
15th	—	0.6 to 161 cases.
22nd	0.4 to 251 cases	0.6 "
29th	0.5 "	0.6 "
36th	—	0.6 "
43rd	0.5 to 251 cases	0.6 "
50th	0.5 "	—
	2.8 grams to 251 cases.	4.2 grams to 22 cases. 4.05 grams to 40 cases. 3.9 grams to 99 cases.

The results obtained in the two hospitals agreed substantially with one another and have been combined. Table II shows the results obtained by the different methods of treatment in different stages of syphilis. The secondary cases in each series contained a substantial proportion of patients who had either suffered from syphilis for at least three months before commencing treatment, or, having been under treatment before, had relapsed. As is well known, such cases are much more difficult to influence from the point of view of the Wassermann reaction. Stage for stage, the cases in both series were, as far as possible, similar, but, if anything, the subcutaneous series contained a larger proportion of these advanced secondary cases.

A study of the table shows that in the primary and secondary stages the results were distinctly better in the subcutaneous series than in the intravenous.

With regard to the tertiary cases, the intravenous apparently gave slightly better results, but the number of patients treated was so small and the results so indifferent in each series that a judgement could be formed only from a much larger number of cases treated for a longer period of time.

In almost all of the subcutaneous series the Wassermann test was applied weekly, and Table III shows the results obtained one week after the fourth injection, and at the end of the course.

Table III is interesting in showing how much more quickly the Wassermann reaction is influenced in the primary than in the secondary and tertiary stages.

In 126 cases (including a number not mentioned in the tables because they had not completed the full course) the *Spirochaeta pallida* was found in one lesion or another before the first injection, and in 123 of these it could not be found twenty-four hours later, though no antiseptic had been applied to the lesion. In one of the cases where the spirochaete was found twenty-four hours after injection the initial dose was 0.3 gram, in another it was 0.4 gram, and in the third it was 0.6 gram. In no case were spirochaetes found forty-eight hours after the first injection. Spirochaetes are found in at least the same proportion of cases twenty-four hours after the intravenous injection of 0.3 gram salvarsan.

In some other cases we have failed to find spirochaetes after a subcutaneous injection of 0.2 gram neo-salvarsan.

We have similarly examined seventeen cases after intramuscular injections of galyl (0.3 gram in two cases and

TABLE II.—*Showing the Wassermann Reaction after the Injection of 2.8 grams Salvarsan Intravenously and after the Subcutaneous Injection of 4.2 grams Neo-salvarsan, or Less, respectively.*

Stage of Disease.	Method.	No. of Cases.	Wassermann Reactions at End of Course.							
			Actuals.				Percentages.			
			+	±	± (double)	−	+	±	± (double)	−
Primary	Subcutaneous	67	0	0	3	64	0	0	4.4	95.5
	Intravenous	79	3	6	4	66	3.7	7.5	5.0	83.5
Secondary	Subcutaneous	76	11	4	7	54	14.4	5.2	9.2	71.0
	Intravenous	141	35	16	8	82	24.8	11.3	5.6	58.1
Tertiary	Subcutaneous	18	10	3	1	4	55.5	16.6	5.5	22.2
	Intravenous	31	18	1	3	9	58.0	3.2	9.6	29.0

Interpretation of symbols: + = Positive reaction; ± = doubtful reaction, nearer positive than negative; ± (double) = doubtful reaction, nearer negative than positive; − = negative reaction.

Notes.—22 received 4.2 grams neo-salvarsan (equivalent to 2.8 grams salvarsan); 40 received 4.05 grams neo-salvarsan (equivalent to 2.7 grams salvarsan); 59 received 3.9 grams neo salvarsan (equivalent to 2.6 grams salvarsan). All cases in each series received one weekly injection of mercury gr. 1.

0.4 gram in the remainder), and have found the *Spirochaeta pallida* twenty-four hours after the injection in fifteen. In two of these cases spirochaetes were found after the second injection a week later, out of a total of four which received a second injection. In the remainder of the cases the course was continued with neo-salvarsan, and, owing to their comparatively feeble effect on spirochaetes, we have discontinued intramuscular injections of galyl.

Although clinical observations are not so valid for purposes of comparison, being open to the objection that they may be biassed, we think it right to say that we early formed a strong impression that the subcutaneous injection of neo-salvarsan influenced syphilitic lesions more rapidly than did intravenous salvarsan. Our judgement in this respect may have some weight from the fact that our experience of the results of intravenous injections is based on some thousands of cases. We have now given over fifteen hundred subcutaneous or intramuscular injections of neo-salvarsan.

TECHNIQUE.

A disadvantage of subcutaneous or intramuscular injections is the pain and local swelling which they may cause, and we have been at some considerable trouble to eliminate these.

According to patients' accounts of it the pain was negligible in many cases. In others it caused considerable discomfort for a week or more, making the patient lame and preventing his sleeping on the same side. At its worst it was not nearly so severe as an injection of salvarsan, but might be compared to a bad mercurial or a calomel injection. In fact, a number of patients complained more of the mercurial injection than the arsenical. We have not been requested by any patient to change over to the intravenous method.

Methods Tested.

We think we have now succeeded in making the injections tolerably free from discomfort, but since others may wish to improve on our technique an account of the methods we have tried up to date may assist them. They are as follows:

1.

Intramuscular injections in very small bulk. The remedy was dissolved in the ampoule itself in 10 to 15 minims of distilled water and injected into the gluteus medius muscle. This caused a fair amount of pain with some lameness afterwards. Accompanied, however, by a hypodermic injection of morphine gr. $\frac{1}{3}$ into a different site, it has generally proved almost as comfortable as any of the following.

2.

Deep subcutaneous injection of the same solution as in (1), the injection being made on to the fascia covering the gluteus medius muscle. This was on the whole less painful immediately afterwards but often caused the formation of a tender lump at the site of the injection some days later.

3.

Similar to (2) but preceded some hours previously by an injection of quinine and urea into the site. This was not a great improvement.

4.

Similar to (2), but the neo-salvarsan was dissolved in a saturated solution of chloretone. The later reactions from this injection were troublesome. Large swellings formed, and in three cases sterile abscesses followed. These were aspirated and the fluid examined. It contained leucocytes, but no micro-organisms or arsenic.

5.

Intramuscular and deep subcutaneous injections of concentrated solutions of neo-salvarsan emulsified in "creocamph" cream of a melting point of 22° C. On the whole this was an improvement. There was pain for some hours afterwards, which kept the patients awake, but as a general rule the patients could allow the site of the injection to be massaged vigorously the following and subsequent days. The discomfort was rather less than that

TABLE III.—*Showing the Wassermann Reaction after the Fourth and after the Seventh Injection of a Course of Seven Subcutaneous Injections of Neo-salvarsan.*

Stage.	No. of Cases.	Wassermann Reactions.															
		Actuals.								Percentages.							
		After Fourth Injection.				After Seventh Injection.				After Fourth Injection.				After Seventh Injection.			
		+	±	± (double)	−	+	±	± (double)	−	+	±	± (double)	−	+	±	± (double)	−
Primary with negative Wassermann reaction	39	0	0	0	39	0	0	0	39	0	0	0	100	0	0	0	100
Primary with positive Wassermann reaction	28	10	1	5	12	0	0	3	25	35.7	3.5	17.8	42.8	0	0	10.7	89.2
Secondary	74	41	9	7	17	10	4	7	53	55.4	12.1	9.4	22.9	13.5	5.4	9.4	71.6
Tertiary	18	14	1	1	2	10	3	1	4	77.7	5.5	5.5	11.1	55.5	16.6	5.5	22.2

Symbols the same as in Table II.

which follows an intramuscular injection of galyl. After a few days a dull aching pain was experienced which lasted for a week or longer.

6.

Similar to (5), but to overcome the immediate pain the injection was accompanied by a hypodermic injection of morphine into a different site. The results were successful in a few cases but on the whole uncertain, the later reaction being still rather troublesome.

7.

The solution of neo-salvarsan in glucose and stovaine solution with the addition of guaiacol, as recommended recently by Balzer and Beauxais-Lagrave.[4] These authors recommend a dose of 0.2 gram neo-salvarsan at one time, and in this amount the injection is practically painless. The disadvantage is that the injections have to be repeated more frequently. In a dose of 0.6 gram the local reaction was rather similar to that of (5) and (6). It is claimed by the authors of the glucose, guaiacol, stovaine mixture that the neo-salvarsan in it remains unchanged though exposed to the air. We have injected it a week after our own preparation without untoward effect. A similar preparation of uncertain age which was supplied to us by Messrs. May and Baker in a convenient form, ready for injection, was safely administered three weeks after receipt. It shares with the creo-camph mixture the disadvantage that unless prepared in the syringe itself it is rather wasteful of neo-salvarsan, since a fairly substantial proportion of the mixture sticks to the sides of the mixing vessel, and more than the required dose has to be made up to allow of this.

8.

Injection of 0.6 gram neo-salvarsan dissolved in 1 c.cm. of a 4 per cent. solution of stovaine, and made up to 2 c.cm. with creo-camph cream melting at 15° C.* (Burroughs, Wellcome, and Co., special formula).

This has proved the most comfortable injection up to the present. In some cases it has been accompanied by a hypodermic injection of morphine gr. $\frac{1}{3}$. This has been sufficient to overcome the dull ache in the site of the injection, which may last for about six hours afterwards.

The solution is effected by dissolving the neo-salvarsan in the syringe, the creo-camph is added, and the mixture well shaken.

The injection is made about a point three finger-breadths below the crest of the ilium on a line joining the tuber ischii with a point on the crest of the ilium which is perpendicularly above the great trochanter when the patient is upright. The detached needle is driven into the muscle vertically to the skin.

The general reaction which follows an intramuscular injection of neo-salvarsan is much less than after an intravenous, and we have not experienced any cases of vasomotor disturbance—flushing, constriction of the throat and chest, etc.—such as sometimes follow an intravenous injection. The tonic effect is greater when the injection is intramuscular than when the remedy is administered intravenously. It will be remembered that in the early days, when salvarsan was administered intramuscularly, the tonic effect was a pronounced feature in all reports on the subject.

Conclusions.

1. The intramuscular or subcutaneous injection of neo-salvarsan, novarsenobenzol, or novarsenobillon is superior in immediate therapeutic effect to that of the intravenous injection of salvarsan, kharsivan, arsenobenzol, or arsenobillon.

2. Spirochaetes disappear from syphilitic lesions just as rapidly after the first intramuscular as after the first intravenous injection, and the Wassermann reaction is more quickly influenced.

3. Solution of the dose of neo-salvarsan in 1 c.cm. of 4 per cent. stovaine and emulsion in creo-camph cream eliminates discomfort sufficiently to make the intramuscular injection of neo-salvarsan practicable for routine use.

References.

[1] *Berl. klin. Woch.*, March, 1914. [2] *Muench. med. Woch.*, March 10th, 1914. [3] *Lehrbuch der Haut- und Geschlecht-Krankheiten*, p. 417. [4] *Le Bulletin Médical*, February 17th, 1917.

* Since the above was written we have given a number of injections in which the creo-camph was replaced by campho-phénique, with, so far, encouraging results.

THE LIFE-HISTORY OF BACTERIA.

[With Special Plates.]

BY

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According to current bacteriological theory the "lower" bacteria, whether living a parasitic or a saprophytic existence, are unicellular organisms which are only capable—apart, in certain cases, from endosporulation of a special type—of reproducing themselves by a simple process of transverse binary fission into two equal parts.

In previous publications[1] on the life-history of bacteria I have brought forward evidence which strongly suggested, if it did no more, that the life-cycle of certain of the "lower" bacteria is one of great complexity. From this evidence the conclusion was difficult to escape that under parasitic conditions simple binary fission is probably only one of many phases in the bacterial cycle, which includes an invisible, or almost invisible, filterable stage, and that this also applies to laboratory cultures of organisms of certain diseases. In passing, I may note that my observations in 1914 in typhus fever, and, later, in the same disease,* in cerebro-spinal fever, in scarlet fever, and in measles, as to the existence in the infected body fluids of filterable infective viruses, and of growth from these of non-filterable bacteria, have since been confirmed in the case of laboratory cultures of the azotobacteria by Löhnis[2] in the summer of 1916. This observer, however, has recorded no details of his filtration experiments, and does not state if his cultures were from single colonies, or from single organisms, or if he carried out direct observations of growth from single individuals on the warm stage.

In the present communication I propose to present further pictorial evidence of the complicated life-history of the enteric group of bacteria in so far as this can be studied in laboratory media as opposed to the more natural milieu of infected tissues and body fluids. And to morphological studies of the members of the enteric group I have also added observations on a single strain of a coliform bacillus.

The strains of organisms of the enteric group examined are as follows, their source being also indicated:

B. typhosus.—4 strains. Strain 1, Lister Institute. Strains 2, 3, 4, carrier strains, Addington.
B. paratyphosus A.—3 strains. Strain 1, Lister Institute. Strains 2, 3, carrier strains, Addington.
B. paratyphosus B.—5 strains. Strain 1, Lister Institute. Strains 2, 3, 4, 5, carrier strains, Addington.
B. Shigâ-Kruse.—1 strain. Lister Institute.
B. Y of Hiss.—5 strains. Strain 1, Lister Institute. Strains 2, 3, 4, 5, carrier strains, Addington.
B. Flexner.—3 strains. Strain 1, Lister Institute. Strains 2, 3 carrier strains, Addington.

In Charts 1 to 8 will be seen the results obtained by study of dried film preparations from young cultures from single colonies, whilst in Chart 9, A, B, C, will be seen growth of living organisms from single individuals studied on the warm stage.

All the strains of organisms shown were obtained from the Lister Institute, except the coliform organism.

It is not possible to reproduce here evidence that the morphological results noted in the case of all the strains enumerated above are identical with the results shown in the drawings and photographs of the selected strains. I must be content, therefore, with stating that the essential results were the same in all cases, approximately 1,000 films having been examined. The organisms which I have chosen in order to illustrate my points here are the *B. typhosus* of Eberth, the *B. dysenteriae* of Shiga-Kruse, the *B. dysenteriae* Y of Hiss, and a bacillus of the coliform group.

In order to reduce the chances of error to the minimum, I have, in addition to rigid precautions against contamination to be described later, submitted each strain of the organisms of the enteric group to searching identification

* Microphotographic evidence of growth from filterable virus to non-filterable bacteria in typhus fever, together with experimental evidence of pathogenicity at each stage, as well as evidence of complexity of life-history of the enteric organisms, was presented[3] to the Royal Microscopical Society in November, 1916.

tests—cultural, biochemical, and serological—both at the beginning, during the course of, and at the end of each set of observations, the additional precaution being taken of frequent replating on MacConkey's medium and on agar, and of repeatedly restarting the whole process of examination by subculture from fresh single non-lactose fermenting colonies on the former medium.

In every case the cultures under examination successfully passed at every stage the necessary standard identification tests, the final agglutination results of the three strains of members of the enteric group selected for demonstration being detailed below:

Shiga-Kruse Strain.

Final culture in broth + 10 to phenolphthalein, direct from broth + 20 to phenolphthalein.

Dilution of antiserum 1 in 10; titre 1 in 1,500; date of tubing, September 20th, 1916 (Lister Institute, D. 31).

Final Dilutions.	Result.
1 in 40	Agglutination C.
1 in 80	,, ,,
1 in 160	,, ,,
1 in 320	,, ,,
1 in 640	,, ,,
1 in 1280	,, ,,
1 in 2560	Nil.
Control	Nil.

C = complete.

Incubated for two hours at 56° C., and read after twenty-four hours at room temperature.

B. typhosus Strain.

Final culture in broth + 10 to phenolphthalein, direct from broth + 60 to phenolphthalein.

Dilution of antiserum 1 in 20; titre 1 in 6,000; date of tubing, March 31st, 1916 (Lister Institute).

Final Dilutions.	Result.
1 in 80	Agglutination C.
1 in 160	,, ,,
1 in 320	,, ,,
1 in 640	,, ,,
1 in 1280	,, ,,
1 in 2560	,, ,,
1 in 5120	,, ,,
Control	Nil.

Incubated for two hours at 56°C., and read after one hour at room temperature.

Bacillus Y of Hiss.

Final culture in broth + 10 to phenolphthalein, direct from broth + 20 to phenolphthalein.

Dilution of antiserum 1 in 10; titre 1 in 1,500.

Final Dilutions.	Result.
1 in 40	Agglutination C.
1 in 80	,, ,,
1 in 160	,, ,,
1 in 320	,, ,,
1 in 640	,, ,,
1 in 1280	,, ,,
1 in 2560	Nil.
Control	Nil.

Incubated for two hours at 56°C., and read after twenty-four hours at room temperature.

The precautions taken against contamination were as follows: The culture media employed throughout were peptone agar and peptone broth, the latter + 10 to phenolphthalein, + 20 to phenolphthalein, and + 60 to phenolphthalein, the last being only exceptionally employed.

1. The acid broth in each case was, after tubing, autoclaved for thirty minutes at 120° C. under a pressure of 20 lb.

2. Control tubes of uninoculated acid broth were incubated at 37° C. for the same length of time as the inoculated tubes. In no case was any turbidity or deposit observed after prolonged incubation.

3. In many of the cases the acid broth was contained in specially-made silica glass flasks, the narrow necks of which were closed with rubber teats sterilized by one hour's immersion in pure lysol, and subsequently dried in sterile metal boxes for twenty-four hours at 56° C. In this way it was possible entirely to avoid the use of plugs of wool, and to inoculate, or withdraw fluid from, the tubes with sterile Pasteur pipettes in the actual flame of a Bunsen burner. The use of these flasks also gave an absolute guarantee that only clean vessels were employed, each flask being heated to not less than 300° C. before use.

4. Deposits were obtained in all cases by centrifuging for three to five minutes the broth in small pointed serum tubes, each tube being sufficiently heated before filling to ensure carbonization, and subsequent destruction, of any material left after routine cleaning by previous use. In this way it was possible to be certain that no organisms foreign to the inoculated broth under observation were present in the tubes employed.

5. All glass slides for microscopical examination were treated in the same way, even after thorough cleansing with boiling acid and bichromate solutions. New slides were employed throughout.

6. The Congo red emulsion (vide infra) was made up daily, or on alternate days, with freshly distilled water, this being obtained for each set of experiments by distilling from a clean Jena flask fitted with new glass tubing. The emulsion was finally boiled in each case before use. In control films of Congo red alone no organisms could be seen. In this way a dangerous source of error, due to mixing with tap water, or with distilled water from the ordinary laboratory still, was entirely avoided.

NOTE.—In the case of dried films I employ a 1 per cent. solution of HCl in alcohol in order to avoid distortion of outline, control observations without the acid-alcohol bath showing that if heat be not employed in drying, the use of a bath of this strength does not cause shrinkage or other distortion.

At the outset of the work considerable difficulty was encountered in making satisfactory morphological studies of the organisms in question on account of their small size, ordinary cultures of members of the enteric group providing organisms varying in size from approximately .5 μ to 2 μ. In Benians's Congo red adsorption method, described by him in 1916,[4] I found, however, an invaluable method for studying the morphology of killed organisms, without any of the disadvantages inseparable from the use of basic stains, though in all cases the results obtained by the Congo red method were confirmed by staining methods as well. The chief advantage of the method is the apparent increase in size of bacteria when emulsified with Congo red, as compared with the results obtained by staining methods, or even by Burri's adsorption method.

This apparent increase in size, however, was not sufficient for my purpose, as, although evidence of complex life-histories can—once one's attention has been arrested thereby—be unmistakably made out, both in stained films and in Congo red films of ordinary cultures in + 10 broth, the size of the organisms in these cultures is not sufficiently great to enable one to arrive with certainty at a correct interpretation of the different forms seen.

By the use, however, of broth + 20 to phenolphthalein, and by subculture from this to agar or to MacConkey's medium, thence back again to ordinary broth + 10 to phenolphthalein, I found that a great increase in size can with patience be obtained, still giving the classical cultural, fermentative, and serological reactions. This was particularly the case with the *B. typhosus*, with the bacillus of Shiga-Kruse, with the Y bacillus of Hiss, and with the coliform organism examined. In the case of both the paratyphoids and of the *B. dysenteriae* of Flexner, a considerable increase in size was also obtained by using these acid cultures, though so far I have not succeeded in obtaining the same increase as in the case of the other organisms mentioned.

Before going through the drawings, for which I am mainly responsible, and the photographs, for which Mr. Martin Duncan's skill and tireless enthusiasm are solely responsible, it is necessary briefly to deal with the possibility that many of the types of organism shown are merely involution forms.

That this is not the case is shown by the following considerations:

1. The "aberrant" forms shown are young, freely growing, freely dividing organisms. By the use of the Congo red method, the relative age of organisms can be fairly accurately gauged, owing to the fact that young organisms are brightly refringent, older organisms being faint or dark in colour.

2. In the case of the *B. typhosus*, the Y bacillus of Hiss, the bacillus of Shiga-Kruse, and the coliform organism, the growth in broth + 20 to phenolphthalein was no less

free and vigorous than in broth + 10 to phenolphthalein, and it was in these that the largest and most "aberrant" types of organism occurred in the greatest numbers. Moreover, in broth + 60 to phenolphthalein, the degree of turbidity produced by the *B. typhosus*, and by the organism of the coliform group, was greatly in excess of that produced by these organisms in standard broth + 10 to phenolphthalein.

3. These "aberrant" types maintained their "aberrancy" for several subcultures when put back into broth + 10 to phenolphthalein, even when the latter was inoculated direct with single colonies from MacConkey's medium.

4. They were seen in small numbers, if carefully searched for, in cultures in broth + 10 to phenolphthalein, which had never been inoculated from broth of a higher acid titre.

This was also true of single colonies on MacConkey's medium, or on agar, that had not at any time been derived from incubated broth cultures, but had been isolated direct from the faeces or urine of carriers.

5. The same types of "aberrancy" were seen in every one of the different organisms shown, as well as in all the strains of all the organisms not shown, and of the different strains of the organisms, single strains of which are shown.

In the accompanying photographs and drawings attention is called to the following points:

1. It is not claimed that a complete history of bacterial life-cycles can be worked out in acid broth cultures. This can only be obtained by extensive experimental observations, side by side with comprehensive morphological studies of organisms as they occur in the infected tissues and body fluids of subjects of disease. These, in the case of members of the enteric group, have yet to be undertaken.

2. In all the broth cultures studied reproduction by simple binary fission was still the predominant feature, and in studying the "aberrant" types of reproduction of single living organisms on the warm stage on solid media, such as gelatin-agar, ordinary binary transverse fission was found eventually to hold the field mainly, though not absolutely, to the exclusion of other types of reproduction. It appears from these observations from single living individuals on the warm stage that reproduction by gemmation occurs freely, in conjunction with ordinary binary fission, only so long as growth proceeds in the thin layer of broth on the coverslip, and largely comes to an end when colonies are beginning to form on the solid medium. This abrupt transition is well seen in Chart 9, as is also the familiar "slipping" phenomenon described by Hill in 1904.

3. The percentage population of "aberrant" forms in ordinary broth cultures + 10 to phenolphthalein was low, but the chief types of "aberrancy" recorded could always be found if persistently searched for.

4. The percentage population of "aberrant" forms in broth cultures + 20 and + 60 to phenolphthalein, as well as in subcultures of these in ordinary broth cultures + 10 to phenolphthalein, was high, each field of the microscope yielding, in good films, characteristic types.

5. Each photograph is designed to show at the optimum focus not more than a very small number of types.

6. The number of types which can be seen in any acid culture exceeded one hundred. To reproduce a comprehensive picture by photographs alone was therefore impracticable.

7. In consequence it became necessary to make composite drawings with the camera lucida of the chief types observed in one, or at the most two, film preparations from one strain. These drawings represent, in the case of killed organisms, selected individuals from a large number of fields, and must therefore not be read as representing average fields.

8. At first sight, inspection of the drawings in Charts 1 and 2, and in the photographs of killed organisms, suggests meaningless chaos.

9. Once, however, it is grasped that reproduction by gemmation is the key to the "aberrant" forms shown, and that gemmation may be terminal, median, or superficial, the main types fall into line. That true gemmation occurs of these three types is shown in Chart 9, representing growth from single organisms on the warm stage.

10. There is no evidence that a given strain represents a mixture of several strains, this suggestion being largely excluded by study of gemmating forms before fission has taken place, and by study of the actual process of gemmation on the warm stage.

11. The correct explanation of the superficial gemmation origin of the crucial and radiate forms shown is more difficult to establish than is that of the terminal, median, and simple superficial forms of gemmation.

The points against a mere apposition explanation of these crucial and radiate forms are as follows:

(*a*) Strict rectangular symmetry is the rule.

(*b*) The diameter of the central brightly refringent node is frequently twice that of the organism which might otherwise be interpreted as lying in contiguity.

(*c*) Superficial buds can frequently be observed on the parent bacillary stem before "sprouting" has commenced, and during the act of sprouting.

12. Sagittal segmentation of buds can frequently be seen, both in the case of dried organisms and of single living organisms, before separation from the parent stem has begun. This sagittal segmentation can be seen in terminal, median, and superficial buds.

13. Transverse segmentation of buds—ordinary binary fission—also frequently occurs, the parent stem also presenting buds undergoing sagittal segmentation, the actual occurrence of which was watched on the warm stage, as shown in Chart 9.

14. Undetached buds may vary in size from about 0.1 μ to several μ in their greater diameter, every intermediate size—from the filterable to the non-filterable—being capable of recognition in the same film in favourable cases (vide photographs of dried films).

15. The appearance of minute buds on a large scale is inconstant in broth cultures, as observed in dried films. In the study of growth from single organisms on the warm stage it occurs frequently, only a relatively small number, however, coming to maturity on solid media, the majority fading and disappearing.

16. The appearance of the very minute forms seen in Charts 1, 3, 4, 5, and 9, makes it impossible to be certain, without prolonged observation on the warm stage, that in attempting to obtain cultures from single individuals of normal size by Barber's method, or by the fragmented slip method of isolation, one is not in reality cultivating from several individuals. Unless, therefore, the presence of these minute forms can be excluded, the use of these two methods for obtaining cultures in liquid media from single organisms cannot be relied on.

17. In the warm stage studies the use of oil-immersion lenses was found to be essential to detection of minute buds, control observation with $\frac{1}{6}$ dry lenses, even with high compensating oculars, often failing to reveal their presence.

18. The presence of these minute forms is probably the explanation of the apparent filterability through Chamberland filters of such relatively large organisms as the *Bacillus bronchisepticus*, and is perhaps responsible for the general view that even well-made Berkefeld filters are not suitable for bacteriological work.

19. By the dark-ground method of illumination many of these small detached buds appear as minute bacilli in the act of undergoing binary fission. Not infrequently these appear as coccoid bodies, if binary fission has not begun. In the study of aberrant bacterial forms with dark-ground illumination the use of the hanging drop method, apart from the inherent fallacies of dark-ground work, is fatal to correct interpretation unless streaming movements have first been reduced to a minimum. For example, it is frequently stated that apparent branching in bacteria is in reality simulated by mere apposition, and that observation of a hanging drop with dark-ground illumination will soon dispel the illusion, separation of apposed organisms sooner or later always taking place. On casual inspection of dark-ground hanging drops this statement appears to represent the truth, especially if streaming movements are still free. If, however, a drop of emulsion be firmly pressed under a cover-slip and then examined it will be found, streaming movements now being reduced to a minimum, that detachment does not invariably take place. That this is not the result of pressure is shown by the fact that in favourable cases long lateral buds will exhibit wide lateral movements,

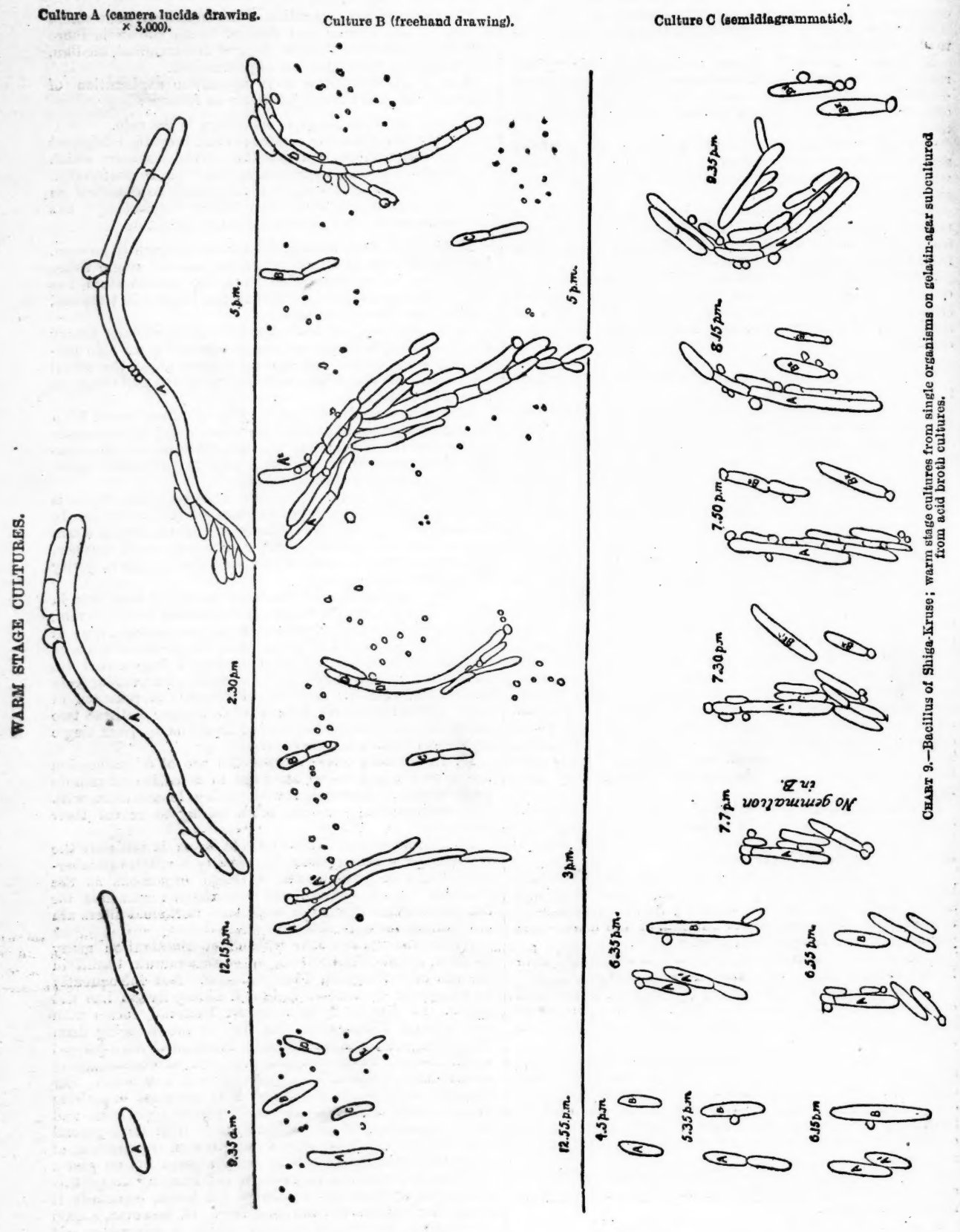

CHART 9.—Bacillus of Shiga-Kruse; warm stage cultures from single organisms on gelatin-agar subcultured from acid broth cultures.

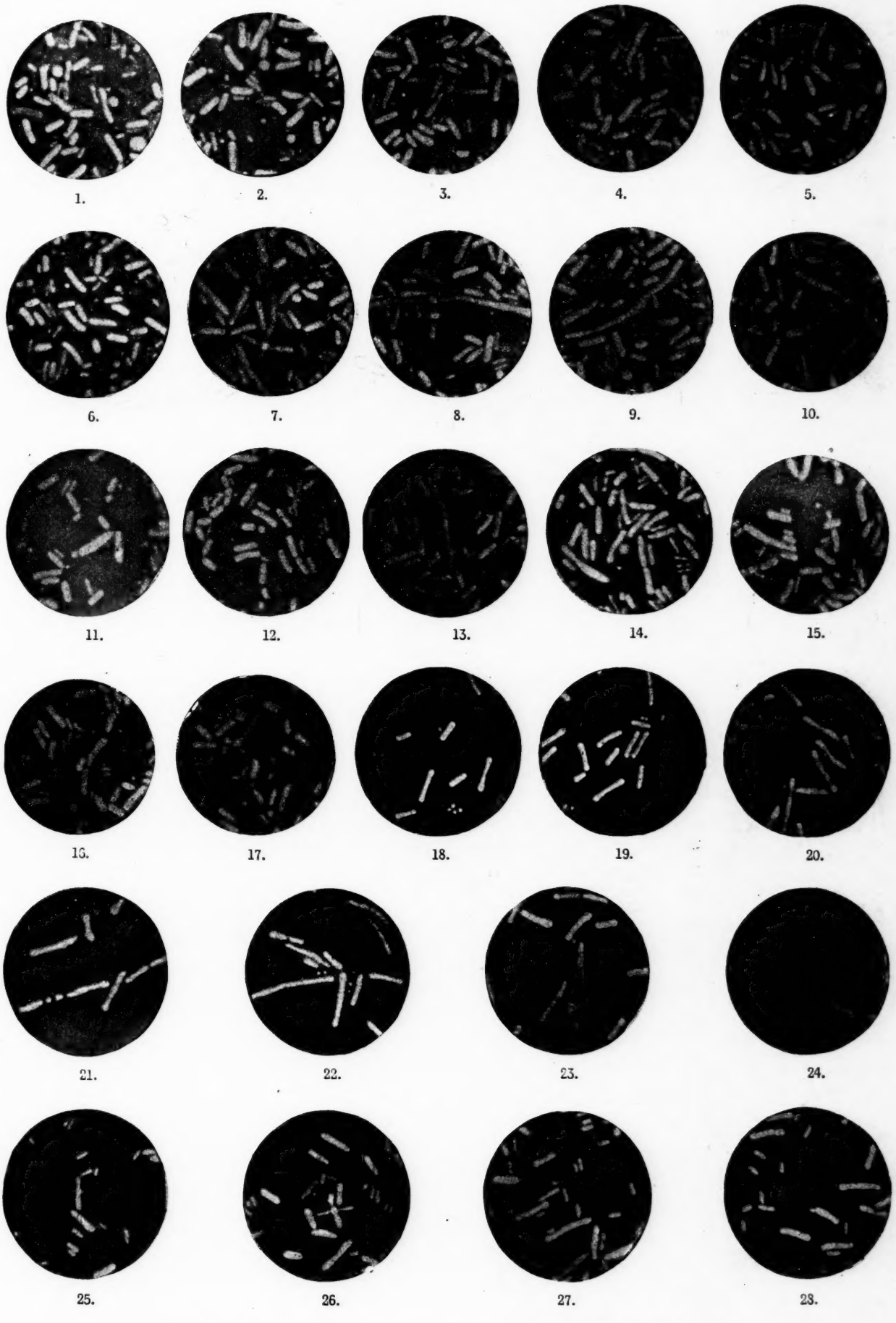

CHART 5.—*Shiga-Kruse Bacillus.* Dysentery. × 1,500. (F. Martin Duncan, Photo.)

CHART 6.—*Shiga-Kruse Bacillus.* Dysentery. × 1,500. (F. Martin Duncan, Photo.)

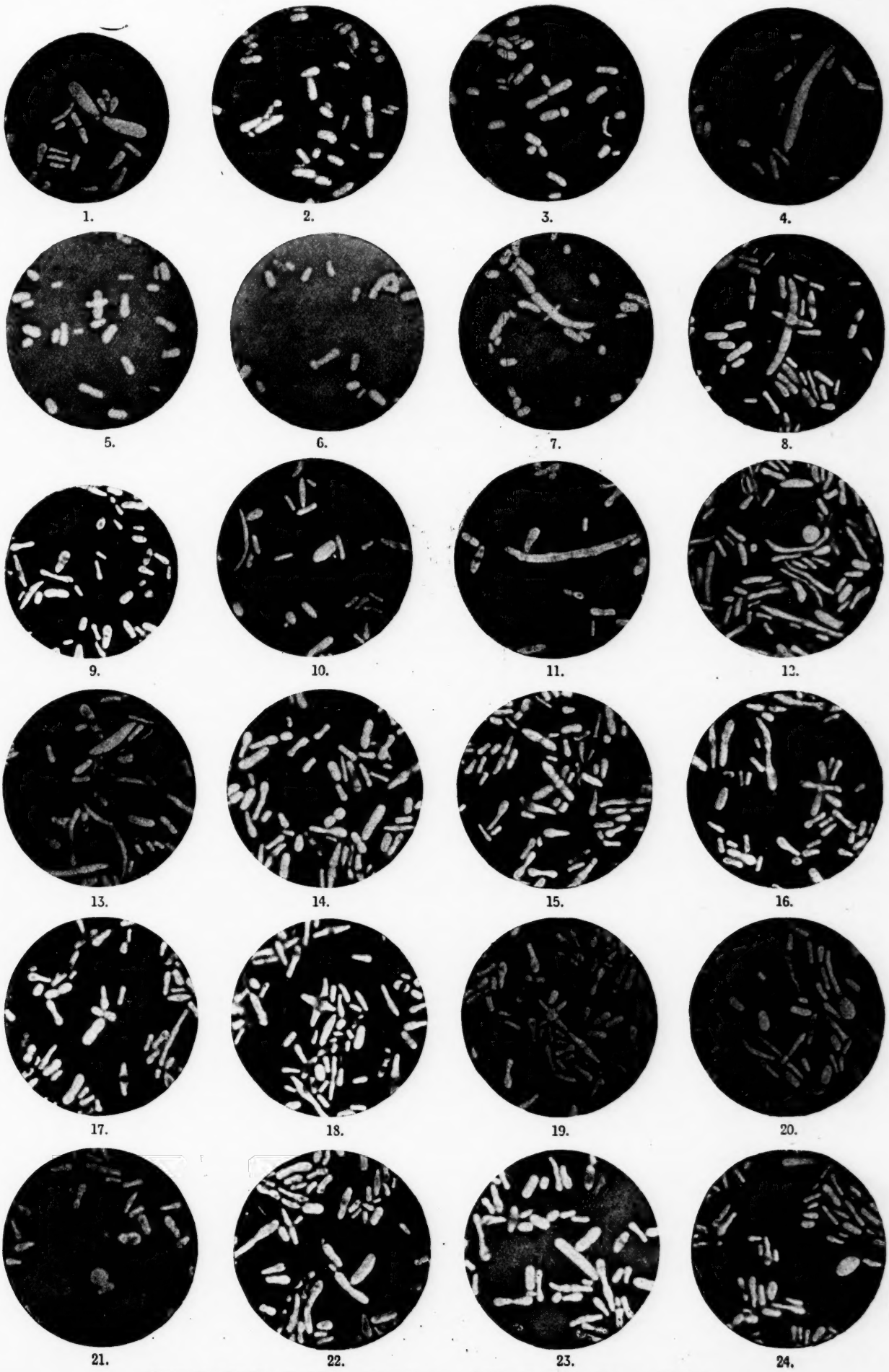

CHART 7.—*Bacillus Y of Hiss.* Dysentery. × 1,500. (F. Martin Duncan, Photo.)

Simple transverse fission into two equal parts.
(*a*) Refringent throughout. (*b*) Refringent at poles only (Artaud).

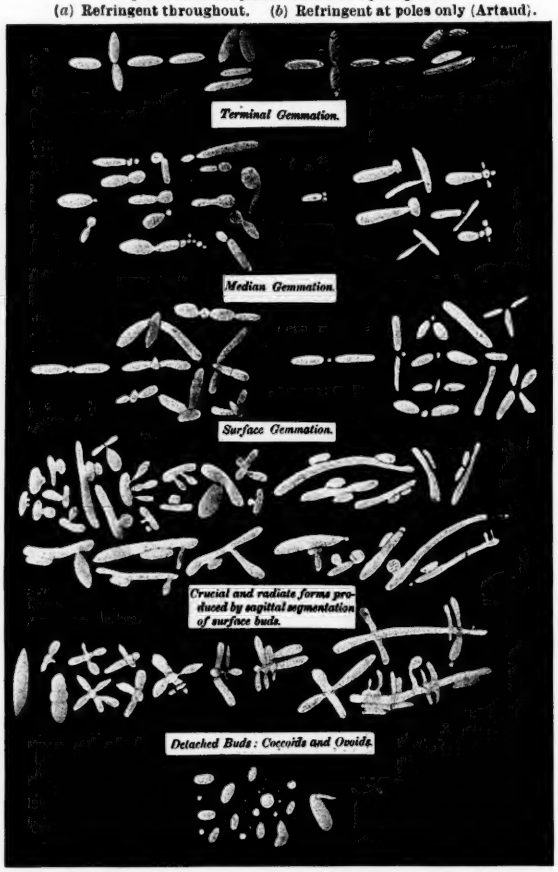
Terminal Gemmation.
Median Gemmation.
Surface Gemmation.
Crucial and radiate forms produced by sagittal segmentation of surface buds.
Detached Buds: Coccoids and Ovoids.

CHART 3.—*Shiga-Kruse Bacillus.* Dysentery. Acid broth + 10 to phenolphthalein mixed with broth subculture from the same. (Camera lucida drawing. × 3,000. E. C. H. *del.*, E. A. H. *pinx.*)

Simple transverse fission into two equal parts.
(*a*) Refringent throughout. (*b*) Refringent at poles only (Artaud).

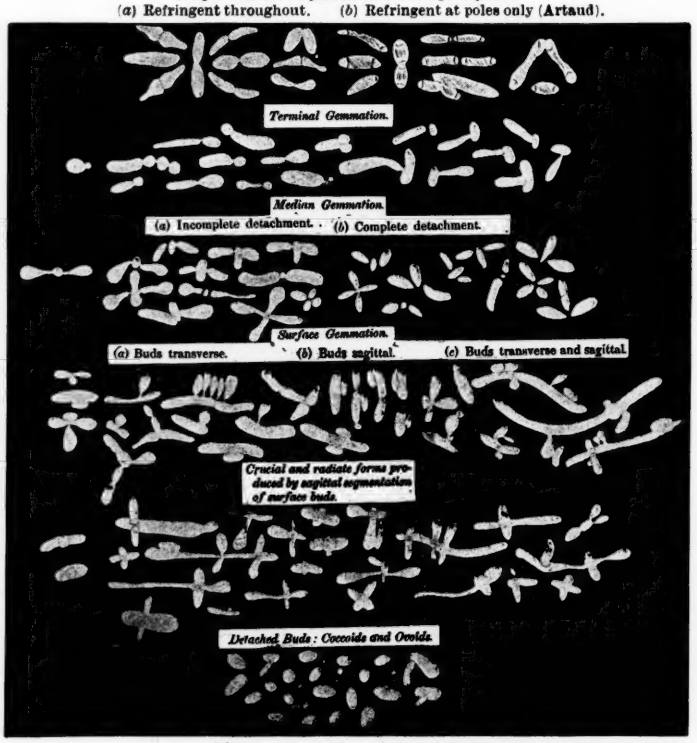

CHART 4.—*Bacillus Y of Hiss.* Dysentery. Acid broth + 10 to phenolphthalein mixed with broth subculture from the same. (Camera lucida drawing. × 3,000. E. C. H., F. M. D. *del.*, E. A. H. *pinx.*)

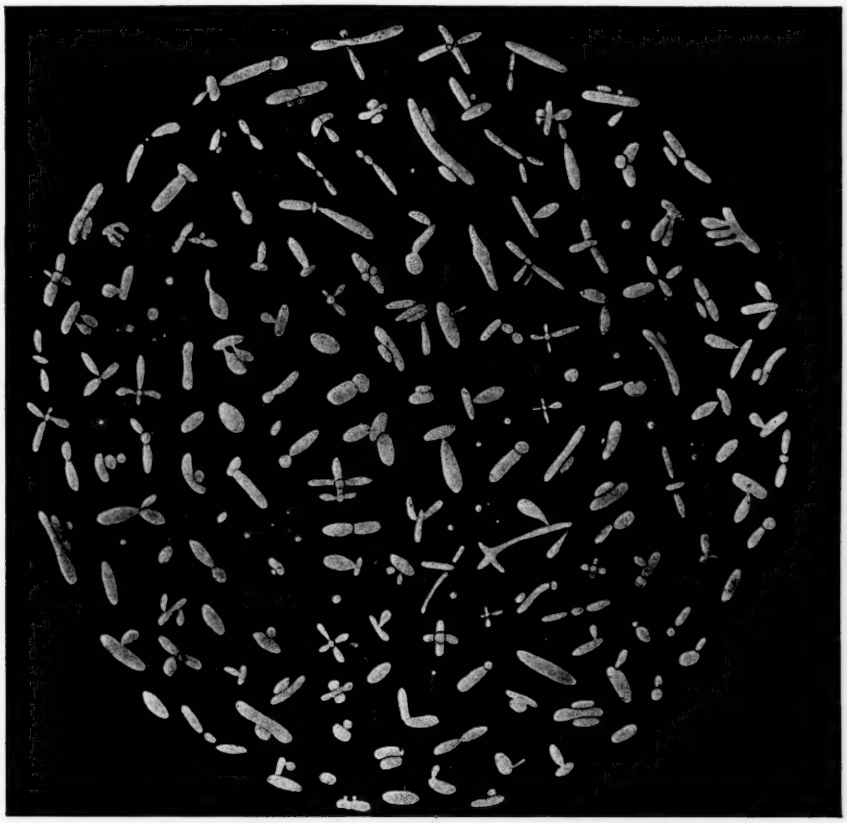

CHART 1.—*Bacillus typhosus.* + 60 to phenolphthalein broth culture, mixed with + 10 to phenolphthalein broth culture from same. (Camera lucida drawing. × 3,000. E. C. H. *del.*, E. A. H. *pinx.*)

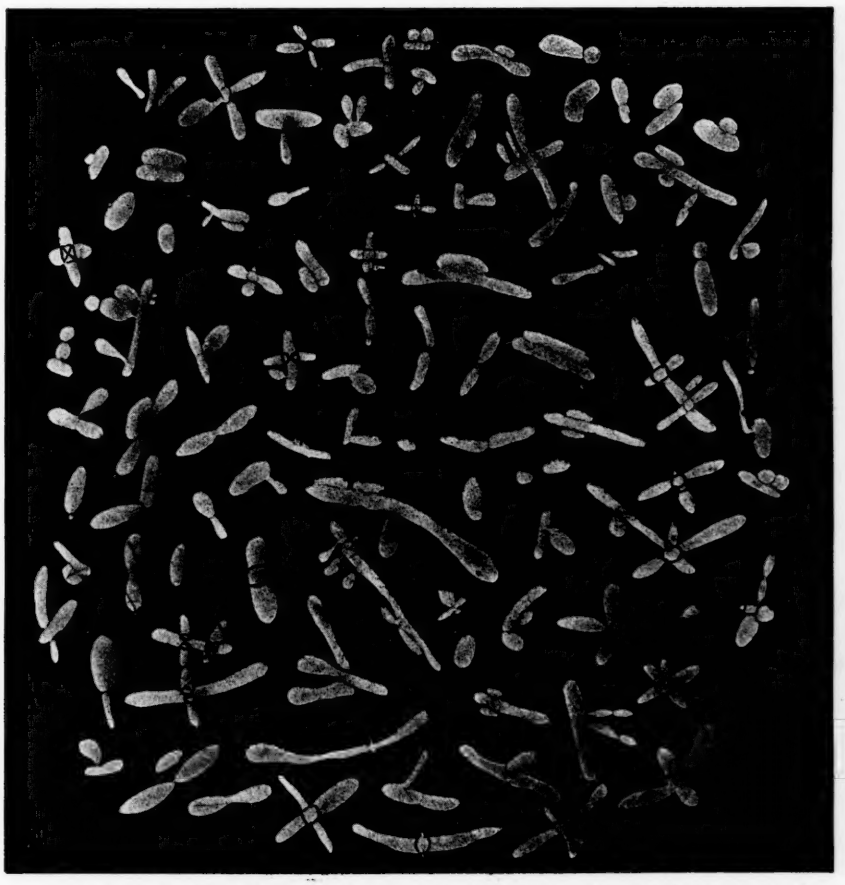

CHART 2.—*Bacillus coli communis.* Acid broth + 10 to phenolphthalein, mixed with broth subculture from the same. (Camera lucida drawing. × 3,000. E. C. H. *del.*, E. A. H. *pinx.*)

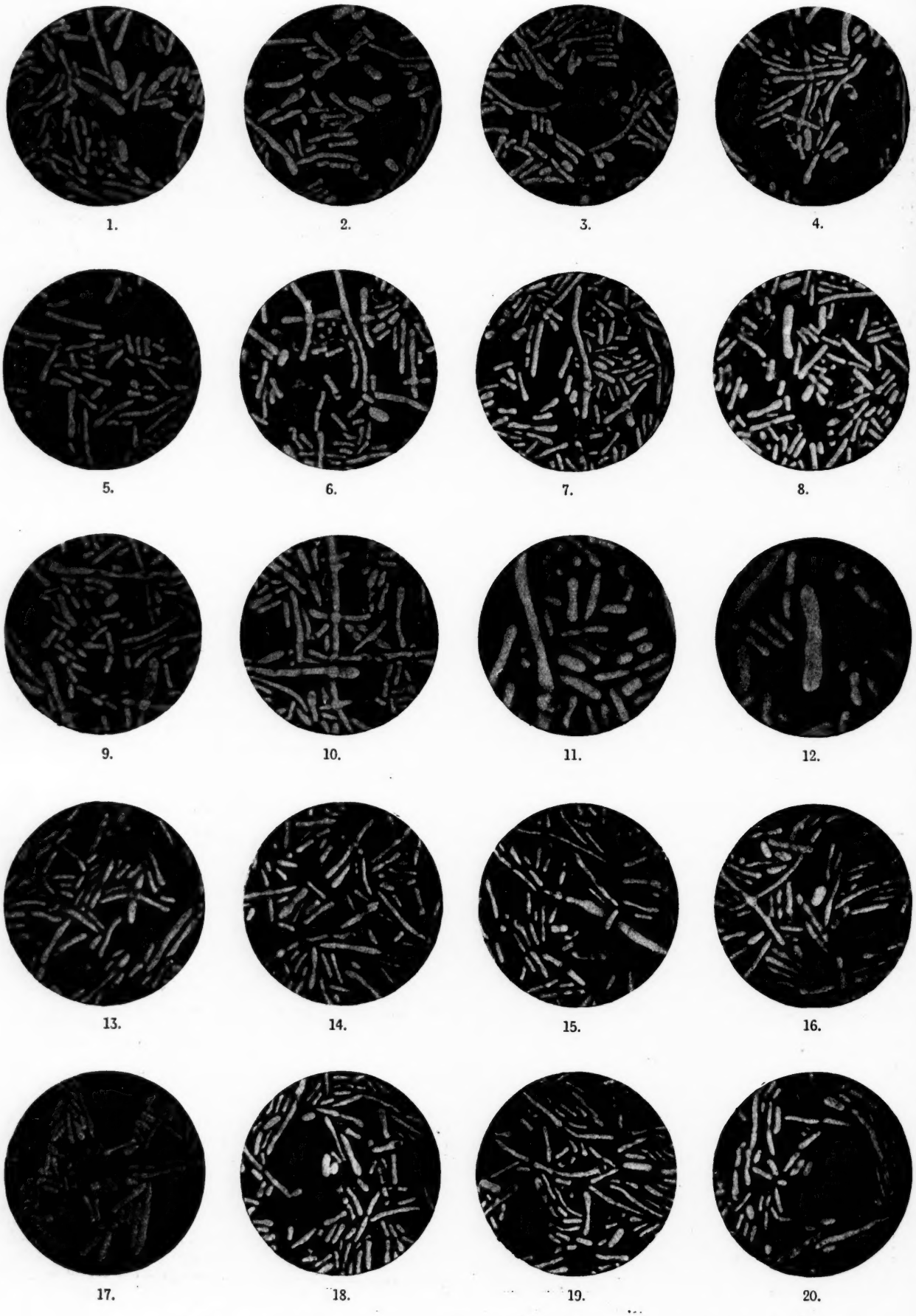

CHART 8.—*Bacillus coli communis.* × 1,500 and 2,300. (F. Martin Duncan, Photo.)

whilst the base, or point of attachment to the parent stem, remains fixed. In other cases short lateral buds retain their relative position to the parent stem, itself exhibiting unfettered rotatory movements. The accuracy of these observations is confirmed in Chart 9 of warm stage studies.

Conclusions.

It has, of course, long been recognized that changes in the cultural environment of bacteria may sometimes be followed by corresponding morphological adaptations.

By many students such changes in form have been summarily dismissed, on the facile theory that cultural contamination has occurred. The rigid precautions taken in these experiments to exclude such accident, and the fact that gemmation took place under observation on the warm stage, disposes of the contamination theory.

By other students aberrant morphological types of bacteria are frequently put aside on account of their supposed involutionary nature. The term "involution form" may, perhaps, be legitimately applied to the bizarre deformities seen in dying or dead individuals in old or otherwise unsuitable media. But to apply the term to young, freely growing, freely dividing organisms under the optimum cultural conditions employed throughout in these experiments would be hardly reasonable.

By still other observers the morphological changes which may follow alteration of bacterial environment have in the past been looked upon as genuine mutation phenomena, and by some authorities the term "polymorphic" or "pleomorphic" is inaccurately restricted to such alleged examples of mutation. These latter writers deny the occurrence of bacterial mutation, and dogmatically assert that pleomorphism—in the limited sense above defined—is unknown amongst the bacteria, heedless of the fact that the genuine type of pleomorphism exhibited, for example, by the protozoa and the parasitic fungi in the orderly sequence of the manifold cycles of their complex life-histories, would equally apply to the bacteria, once it was proved that they too can reproduce themselves in other ways than by simple transverse binary fission into equal parts.

Finally, it is often assumed that because bacteria appear to breed true to type—that is, to laboratory type—in standardized laboratory cultures, simple transverse binary fission is the sole method of reproduction under natural saprophytic and parasitic conditions which are not, and never can be, standardized.

As, however, I have shown, evidence of complex bacterial life-cycles is constantly before us even in ordinary standardized laboratory media, though it may, and often does, require persistent looking for.

The truth, in fact, appears to be that we have gone astray in this matter because we have in the past invoked too easily the theories of contamination, of involution forms, and of mutation (vide note, infra*), and have forgotten that the normal habitat of bacteria, both as saprophytes and as agents of disease, is under perpetual assault, leading to endless instability of environment.

From these morphological observations it is clear that bacteria can, and do, reproduce themselves in other ways than by simple binary fission, and that the life-cycle in some cases includes an invisible or almost invisible phase. Our present conception, therefore, of the rôle played by bacteria, both as saprophytes and as causal agents of disease and its sequels, will have to be profoundly modified.

I wish to take this opportunity of recording my grateful thanks to Mr. Martin Duncan, not only for his beautiful photomicrographic work, but also for the material assistance he has given me throughout. I wish also to acknowledge my great indebtedness to the Committee of Management of the Addington Park War Hospital, in the laboratory of which the experiments were carried out, for the far-sighted policy which has provided every possible facility for the prosecution of the work.

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* As already stated, the observations here recorded are confined to cultures from single primary colonies, and in consequence these observations only deal with changes in morphology which are not associated with observed changes in fermentative and serological reactions. I have, however, noted, especially in the case of the bacillus of Shiga-Kruse and of *B. paratyphosus* B, that profound "biochemical," and even serological, changes may take place in the case of secondary colonies from pure cultures in some of the plates after prolonged standing, and repeated subculturing from acid media. Changes in fermentation reactions of secondary colonies of bacteria have in the past been frequently noted by numerous observers, and the occurrence of a genuine form of bacterial mutation has been invoked to explain these changes. In many such cases the occurrence of morphological types of aberrancy has also been noted, and again the mutation theory has been used in explanation thereof. The most striking of these are the observations of Horrocks[5] in 1911 in the case of the *B. typhosus*, independently confirmed by Almquist in the present year. In all these observations, however, of changes in morphology, whether associated or not with fermentation and serological changes, the question of such changes representing phases in bacterial life-histories in orderly sequence does not appear till now to have been raised. And this appears to be due to the fact that the morphological changes have not been studied by continuous observation of growth from single organisms on the warm stage. As, however, I have shown, this is essential to correct interpretation of alleged mutation phenomena, whether of a morphological or of a "biochemical" nature, though the ultimate fate of the bacillary buds here described, and of the associated changes of fermentation and serological reactions of these daughter cells when living an independent existence in laboratory media, must be left to a further communication.

TETANY AND THE FUNCTIONS OF THE PARATHYROIDS.

BY

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In conjunction with

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THE following is a brief abstract of a series of papers published in the *Quarterly Journal of Physiology*, vol. x, Nos. 3 and 4 (March 26th, 1917), giving a detailed account of an extensive experimental investigation upon the physiology of the parathyroids and the relationship of the tetany which follows removal of these structures to the idiopathic tetany so common in childhood. The clinical importance of the subject is the reason for bringing it in this way under the notice of the medical profession generally.

A. *The Nature of Idiopathic Tetany and the Various Theories which have been from time to time advanced regarding its Etiology.*

One hundred years ago Clarke for the first time described, as accurately as can be done to-day, the symptomatology of this clinical entity, and suggested a cerebral change as the *fons et origo*. This pioneer's work, however, was not accepted by his immediate successors, and it was not until fifty years later that the common origin of all the different manifestations (carpo-pedal spasm, laryngismus and convulsions) was admitted. Trousseau in 1860 considered it of rheumatic nature; later, Cheadle and Kassowitz looked on it as merely a manifestation of rickets; still later, Henoch suggested an error of metabolism, which for Biedl was the production of a toxic substance from the decomposition of histidin, for Quest a deficiency of calcium, and for Stoelzner a calcium intoxication. Finally, Janasse has more recently, on the ground of histological examinations of the parathyroids in cases of tetany, incriminated these structures.

B. *Previous Work on Tetania Parathyreopriva.*

The work already done on the tetany following removal of the parathyroids may be considered in three periods: First, that preceding the discovery of the parathyroids; secondly, that during which the independence of the thyroids and parathyroids was not recognized; and, thirdly, that in which the complete independence of these structures had been established. As a result of the evidence forthcoming, the conclusion may be drawn "that

the nervous symptoms are due to the removal of the parathyroids."

This being so, the method adopted in our experiments was that of complete thyro-parathyroidectomy, since by no other method can removal of the parathyroids associated with the thyroid be carried out with certainty. The existence of supplementary parathyroids in the thymus, especially in cats and dogs, renders it impossible in every case to secure complete removal of all parathyroid tissue.

C. *The Symptoms following Parathyroidectomy.*

These may be classified as those of depression, emaciation, spasticity (chiefly extensor), tremors and fibrillar twitchings, jerkings, convulsions, and disturbances of balance. Great variation in these symptoms occurs in different animals and in the same animal at different times, and considerable difficulty is thus introduced in determining the value of remedial measures.

The development of spasticity is most characteristic of young animals, and in monkeys it may lead to the manifestation of the typical position of the hand seen in idiopathic tetany—the clenched fist or accoucheur's hand.

D. *The Part of the Central Nervous System Affected.*

All the nervous symptoms of tetania parathyreopriva are due to the condition of the central nervous system, since they are at once abolished in any part of the body by section of the nerve. Decerebration has been found to increase the violence of the symptoms by removing the controlling influence of the cerebral arc. Section of the cord, by removing the influence of the cerebellar arc, prevents the development of spasticity in the parts of the body behind the level of section, but leaves the tremors and jerkings unaltered. Section of the dorsal roots of the spinal nerves to the hind legs does not stop the tremors and jerkings.

These experimental results indicate that the structures primarily affected in the production of the symptoms are the cells of the efferent neurones in the anterior horns of the spinal cord. The occasional onset of epileptiform convulsions probably indicates a secondary implication of the cortex cerebri, and the disturbances of balance, which so frequently appear, point to a secondary affection in the cerebellum.

E. *The Increased Excitability of the Peripheral Nerves and of the Muscles (of the Neuro-myon).*

This was first described by Erb in 1874, and it is now generally accepted as the most reliable test of the existence of tetany, both idiopathic and following parathyroidectomy.

In this abstract it is not necessary to consider in detail the methods employed, the tests for the limits of accuracy of the method, or the nerve and muscle selected for stimulation. The want of any real knowledge of the factors modifying the electrical excitability compelled us to devote considerable time to a study of the limits of physiological variation from day to day, the effects of anaesthetics, of temperature, of asphyxia, of anaemia, of decerebration, of section of the spinal cord, and of section of the dorsal roots of the spinal nerves. It was found that none of these interfered with the application of the method to the study of the changes produced by parathyroidectomy or which occur in tetany. Since in the decapitated animal the action of curare leaves unmodified the reaction of the muscle, and since the reaction of the muscle persists for some time after degeneration of the cut nerve, it must be concluded that the muscle is directly stimulated by the electrode placed over it as used in our investigations.

The electrical hyperexcitability following parathyroidectomy has been clearly demonstrated by previous workers and is confirmed by us. The qualitative change described by some writers—that is, the relative increase in the A.O.C.—is shown to be a sign of no diagnostic significance. That the changes in the excitability of the nerve and muscle are independent of the changes in the cells in the spinal cord, and due to changes in the neuro-myon, is shown by the results of parathyroidectomy after, with, and before nerve section.

The change in the excitability of muscle generally follows that of nerve, but is not usually so marked. It is chiefly due to a change in the neural elements in the muscle, since (1) it is generally removed by curare, (2) it disappears as the nerve degenerates after section, and (3) it is not produced in muscle when it has degenerated. In some cases evidence of the implication of a post-neural structure—the "receptive substance" of Langley—was obtained.

That it is the nerve endings which are acted upon is demonstrated by a series of cross-circulation experiments in which the blood from a normal animal is circulated through the leg of a parathyroidectomized animal so that the posterior tibial nerve and its endings in the flexor brevis digitorum are bathed in normal blood while the sciatic nerve is fed by parathyroidectomized blood. Since the effect of stimulation of the sciatic nerve was reduced along with the reduction in that of the terminal branches, the conclusion is drawn that the nerve endings, and not the nerve fibres, are acted upon.

The symptoms are thus due to some change in the nerve cells of the cord and the increased excitability of the neuro-myon is caused by an action on the nerve endings.

It was found that there is no definite relationship between the symptoms and the electrical hyperexcitability, that the excitability of the peripheral nerve may be high when symptoms are absent, and low when they are present. In idiopathic tetany we found the correspondence between the increased excitability and symptoms to be somewhat closer, but that it is not sufficiently close to allow of the gravity of the condition being estimated by the electrical excitability of the nerve alone.

F. *The Etiology of Tetany.*

The evidence we already possess points to the condition being due to a disturbance of metabolism. The theory of calcium deficiency so ably supported by MacCallum cannot, however, be maintained. The effect of bleeding and transfusing calcium-free chloride of sodium in relieving the symptoms proves that there is not a deficiency of some essential substance, such as calcium, but rather the development of some toxic material.

Various substances have been suggested by previous workers as the possible toxic agent—for example, ammonia, xanthine, and β-iminazolmethylamine. But we have found these not to produce a true tetany.

Certain facts pointed to the possibility that guanidin or methyl guanidin in the body is the cause of the condition. By a series of experiments it is shown that the symptoms of guanidin poisoning exactly simulate those of tetany, and that the electrical excitability of the peripheral nerve is also increased by this substance.

Comparisons of Symptoms in the Conditions Enumerated.

	Idiopathic Tetany.	Tetania parathyreopriva in Man.	Tetania parathyreopriva in Animals.	Guanidin Poisoning.
Increased E.E. ...	+	+	+	+
Depression	+	?	+	+
Emaciation	+	?	+	+
Spasticity	+	+	+	+
Tremors and jerkings	*+	+	+	+
Mechanical excitation	+	+	+	+
Convulsions	+	+	+	+
Laryngeal spasm ...	+	+	+	−
Oedema of hands and feet	+	+	?	?

* This has been observed in the adult, but not, so far as we are aware, in the child.

G. *The amount of Guanidin and Methyl Guanidin in the Blood and Urine of Normal and Parathyroidectomized Dogs, and in the Urine of Children suffering from Idiopathic Tetany.*

The study of these questions by Burns and Sharp shows that these substances are found in increased amounts in the urine of patients suffering from tetany and of dogs suffering from tetania parathyreopriva. It is also shown that there is an increased amount of guanidin in the blood after parathyroidectomy. In the urine it is increased in children 100 per cent., and in dogs 500 per cent., and in

the blood after parathyroidectomy from 400 per. cent. to 1,200 per cent.

It was thought that the action of guanidin in causing tremors of the excised muscle of the frog might be used as a test for its presence in the blood after parathyroidectomy. Wishart studied the action of the blood of parathyroidectomized animals upon such muscles. His experiments show that while the blood of normal animals fails to cause any twitching or any alteration in the form of contraction of the muscle, in several cases twitching, and in a greater number prolongation of contraction, occurred.

H. *The Metabolism after Parathyroidectomy and the Administration of Guanidin.*

A series of experiments carried out by Burns shows the similarity of the changes in the distribution of nitrogen in these two conditions.

These investigations have shown also the close association of idiopathic tetany in man and that following removal of the parathyroids, and that in both the symptoms are due to an increase of the guanidin in the body, but before remedial measures can be considered the exact nature of the change in metabolism must be further investigated. Degenerative changes in the liver have been described by Gozzi and others. Are these primary? Are they the cause of the development of guanidin or are they the result of its action? The question of the source of the guanidin has also to be investigated. It is known to occur in arginin, which is one of the constituents of most proteins. Is the guanidin formed directly from it? Normally the guanidin part yields urea, but a disturbance of metabolism might lead to its persistence as guanidin or methyl guanidin. Again, guanidin is the chief constituent of the creatin of muscle, and it might be derived by some change in the formation of a decomposition of this substance. So far the studies in metabolism afford no indication that such a change occurs, but further work upon the question is in progress.

CONCLUSIONS.

1. The symptoms of tetany are due to some change in the nerve cells of the cord, and the increased excitability of the neuro-myon is caused by an action on the nerve endings.

2. A comparison of the symptomatology of idiopathic tetany, post-operative tetany in man, tetania parathyreopriva, and guanidin poisoning in animals leads to the conclusion that all these conditions are of the same nature, and that the first three are due to the development of guanidin in the body as the result of some interference with the action of the parathyroids which normally control the guanidin metabolism, and by so doing probably influence the tone of the muscles.

3. There is a close association between idiopathic tetany in man and that following removal of the parathyroids; in both the symptoms are due to an increase of the guanidin in the body.

4. It will only be possible to consider remedial measures when these various problems have been cleared up, and further prosecution of the investigation by the combination of clinical and laboratory study seems to hold out the most hopeful promise of further advances.

The work has been done as part of an investigation upon rickets which is being carried out under the Research Scheme of the Medical Research Committee (National Insurance Act). The expenses of the earlier work were partly defrayed by the Carnegie Trust (Scotland).

[The Warren Triennial Prize in 1916 was awarded for this series of papers at the Massachusetts General Hospital. This statement is made at the request of the trustees of the hospital.]

IN the German academic year 1914–15 licences to practise medicine were granted to 1,038 men and 72 women. The corresponding figures for the preceding year were 3,822 and 148. This big drop was due to the granting of licences to many advanced medical students at the outbreak of the war. Thus, for the year 1912–13 there were 1,447 licences granted as compared with 3,822 in the following year, which included the first period of the war. The number of women medical students has increased from 334 in the winter term of 1908–09 to 1,229 in the corresponding term of 1915–16.

SIMULTANEOUS LIGATURE OF ARTERIAL AND VENOUS TRUNKS IN WAR SURGERY.

BY

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CAPTAIN R.A.M.C.,S.R.

CERTAIN surgical ideas have undergone a complete revolution as a result of the additional experiences gained in the war surgery of the past two and a half years. Among these changes perhaps one of the most striking is the difference in attitude towards the question of simultaneous ligature of the main artery and vein of a limb.

C. G. Spencer,[1] writing on this subject, says: "If the vein is wounded as well as the artery the danger of gangrene is greater." In Jacobson's *Surgery*[2] is a short paragraph on ligature of the popliteal artery in which the following warning is given: "It would be well if possible to get leave for immediate amputation if the vein was found injured also, and beyond remedy by suture." Major A. J. Hull[3] says: "Ligature of blood vessels appears to be free from dangerous sequelae. Three exceptions may be made to this observation—the common femoral and the popliteal on account of the liability of gangrene of the limb, and the carotid vessels on account of their distribution to the brain." Lastly, among the small number of authors available at the time of writing, Penhallow,[4] referring to aneurysmal varix, says, "Great care should be taken not to injure the vein, as otherwise gangrene may result. It may be said that the vein is the more important vessel of the two in this respect."

The modern views on this important subject are clearly expressed by Surgeon-General Sir G. H. Makins in his Hunterian Oration of this year (1917). This authority goes so far even as to advise simultaneous ligature of the vein in those cases where it is found necessary to tie a damaged artery, "whether the vein be wounded or no." He gives the following reasons: First, "The elimination in part of the capacious main vein is a real advantage since this for the time affords a too ready channel of exit for the diminished arterial supply as well as an undesirable reservoir for stagnation." Secondly, "The result of the combined procedure being to maintain within the limb for a longer period the smaller amount of blood supplied by the collateral arterial circulation, and hence to improve the conditions necessary for the preservation of the vitality of the limb."

It should be remembered, as Sir G. H. Makins[5] and Delorme[6] have pointed out, that in many injuries of the arteries the vein is also contused and later becomes thrombosed. That the converse is true is well illustrated in Case v. The venous system may be even further restricted without loss of circulation occurring. In Case I, in addition to the popliteal artery and vein, both internal and external, the saphenous veins were tied, and the limb survived.

The following cases, which with one exception have all occurred at a casualty clearing station in the past few months, show the beneficial result of simultaneous ligature of the main vein where the corresponding artery is damaged beyond repair.

Case v is of interest because severe local sepsis was present with commencing gangrene of the group of wounded muscles. A thrombus was removed from the superficial femoral artery, which restored the circulation long enough for healing to commence, before the lumen became again occluded. Case VI, operated on by my colleague Captain G. McMullan, R.A.M.C., is an example of the benefit derived when this method of treatment is applied to the tibial vessels.

Injuries of the posterior tibial artery, whether complicated by fracture of the bones or not, are very likely to take an unfavourable course and end in amputation of the limb. The result in the case quoted was unusually successful, but in view of our previous experience great care was taken to ligature all the veins associated with the injured arteries. Case VII is included as an example of modern blood-vessel surgery. The case if left would have undoubtedly become an aneurysmal varix.

CASE I.

Pte. C. Admitted November 3rd, 1916, 10 p.m., with wound of right popliteal vessels.

On admission there was a wound perforating the calf trans-

versely at the lower part of the popliteal space. The calf was swollen and tense; no pulse at ankle; foot cold and white.

Operation (November 4th, 4 p.m.).—Popliteal space opened up in its whole extent through an internal incision. Remains of inner head of the gastrocnemius cut through. Damaged saphenous vein tied above and below. Both vessels found torn for about one inch. The popliteal vein was ligatured just above the entry of the short saphenous vein.

Result.—On November 5th the foot was warm, pink in colour, sensation present. The three following days gangrene threatened; the foot was purple and oedematous, but there was still some slow circulation. From the 9th to the 14th there was gradual improvement; the foot was pink again, though oedema persisted. The patient was evacuated on November 26th with the circulation apparently re-established in foot and leg.

January 1st, 1917. Letter from patient's brother: "Leg doing well, but patient very ill from septic poisoning."

January 20th. Amputation for sepsis in calf. Details supplied by officer commanding No. 3 A.G.H., Brighton. "Foot becoming white and bloodless."

CASE II.

Cpl. B. Admitted December 4th, 1916, 11 a.m., with wound of left popliteal vessels.

On admission there was a wound over the lower end of the posterior aspect of the thigh. Calf swollen; foot cold and pulseless.

Operation (2 p.m.).—Wound entering popliteal space; opened by dorsal incision. Both vessels torn; suture impossible owing to laceration; tied above and below. Wound drained and closed.

Result.—Uneventful convalescence. Condition of foot never gave rise to anxiety. No oedema. Sent down after three weeks; no pulse to be felt at ankle.

Three months later: "Foot in perfect condition."

CASE III.

Pte. L. Admitted December 13th, 1915, 1 p.m., with wound of superficial femoral vessels.

On admission there was a perforating wound 1½ in. in diameter entering the back of the left thigh and coming out in front through the middle of Hunter's canal. A tourniquet had been applied, and the patient was almost dead.

Operation (2 p.m.).—Anterior wound opened up; both ends of superficial femoral artery and vein tied. Oozing from posterior wound—? profunda vessels.

Result.—Condition gradually improved after twelve hours' severe collapse. The wound became septic, but eventually cleared up. The foot was in a critical state for two days, then circulation improved. Patient sent away after three weeks with small gangrenous areas on tips of toes—like Raynaud's disease.

Letter from England six weeks later: "Foot the same."

CASE IV.

Pte. E. Admitted January 3rd, 1917, 8 a.m., with wound of superficial femoral vessels.

On admission there was a small perforating wound of the upper part of the left thigh, missing the femur. The wound of entry was on the outer side of the thigh; that of exit on the inner side over the femoral vessels. The thigh was greatly swollen; foot cold, and no tibial pulse could be felt.

Operation (January 4th, 11 a.m.).—Hunter's canal opened; clot removed; both superficial vessels tied. Too severely torn to suture. A handful of dark clot removed from interior of thigh. Outer wound slit up.

Result.—On January 15th there was no oedema of the foot—circulation returned in a few hours. No tibial pulse felt. Condition of foot never doubtful.

Letter one month later: "Foot quite healthy."

CASE V.

Pte. H. Admitted January 3rd, 1917, 8 a.m., with wound of the left femoral vein and thrombosis of artery.

On admission the foot was cold; no pulse at ankle. The entry wound was in the upper third, outer side, of the thigh, and the exit wound in the adductor region. A foreign body was found embedded in the opposite adductors.

Operation (January 4th, 12 noon).—The inner wound was widely opened up; dead stinking muscle was freely excised, including nearly all the adductor longus, parts of the pectineus and vastus medialis. The two ends of the superficial femoral vein were found torn across transversely, and sealed by clot, too far away to be united—tied off. The artery was found uninjured but thrombosed—a firm lump two inches above the apex of Scarpa's triangle, and no pulse in Hunter's canal. An incision, one third of an inch, was made into the artery and a small white granular clot squeezed out; from below, three inches of soft red clot was pressed out, like lanoline from a tube. The vessel was closed in the ordinary way, and the pulse returned to the vessel in Hunter's canal, although it was not felt in the foot.

Result.—Fourteenth day: Wounds very septic, but now cleaning up and granulating well. The condition of the foot had never given rise to any anxiety. No pulse to be felt at ankle; slight oedema below malleoli. Twenty-first day: Slight secondary haemorrhage. Wound opened up; artery found thrombosed again. Circulation in foot good; slight oedema.

CASE VI.

Pte. G. Admitted February 13th, 1917, with compound fracture of right tibia; injury to peroneal and posterior tibial vessels.

On admission there was a penetrating wound of the leg; calf swollen and tense; no pulse in foot.

Operation (12 hours after injury).—Wound in calf freely opened up: peroneal artery on back of fibula torn—ligated together with vein. Haemorrhage persisting, the posterior tibial artery was exposed through attachment of soleus to tibia—found torn; artery and venae comites ligatured. A third incision was made in the calf to relieve tension. Carrel's tubes inserted; Thomas's knee splint applied.

Result.—Some oedema of foot, but perfect circulation. Patient doing well when last heard of.

CASE VII.

Pte. M. Admitted November 8th, 1916, with wound of right femoral vein and artery (partial).

On admission there was a perforating wound of the thigh over the line of the artery. Foot cold; faint dorsalis pedis pulse.

Operation (18 hours later).—Lateral tear in vein one inch long, sutured. Partial tear in artery—intima bulging like a small aneurysm—repaired by stitches, and fascial flap from roof of Hunter's canal sewn round.

Result.—Uneventful convalescence.

CONCLUSION.

Only a small series of cases has been brought forward, but the results are interesting. The experience of those who have ligatured the main artery alone will probably show that amputation has often to be resorted to, especially in popliteal cases.

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FURTHER REPORT ON THE EFFECTS OF HIGH EXPLOSIVES ON THE EAR.

BY

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I HAVE had under observation at the West Cliff Canadian Eye and Ear Hospital, during a period of four months, over one hundred cases of injury to the internal ear and its central connexion from high explosives. The chief symptoms are deafness and disturbance of equilibrium (dizziness, etc.). As these cases were first seen after an interval of several weeks or months, in order to observe the more recent effects of such explosives on the ear I was sent to France for six weeks. During this time I was stationed first at a Canadian casualty clearing station (Colonel Blanchard) and then at a Canadian stationary hospital (Colonel Davis). In addition to examining cases of injury to the ear at these stations I was permitted by the courtesy of the officers commanding to examine cases at adjacent casualty clearing stations and at a stationary hospital. The few cases of shell concussion deafness seen may be accounted for by the quietness then existing at these fronts.

The following applies to recent injuries (the cases seen at West Cliff will be dealt with in a subsequent paper). The majority were observed from twenty hours to a week after injury.

I saw over 200 cases exhibiting nerve symptoms ascribed to high explosives. Of these, 50 complained of deafness of varying degree. Of these 50, 17 showed demonstrable signs of injury to the internal ear traceable to the explosive. Of the others, the deafness in many had been temporary and no objective signs of disturbance of equilibrium could now be seen. The persisting defect of hearing was due in some to old middle-ear inflammation, in others to blockage of the external canal from wax or some other cause.

Of the 17 cases—7 had symptoms of nerve deafness without perforation of the membrana tympani, 10 had deafness with signs of recent perforation; 6 had definite middle-ear trouble previous to the concussion; of the other 11, with no previous history of ear trouble, 6 had recent perforation; 12 complained of vertigo and had observable signs due to it, the others had no complaints or symptoms of equilibrium disturbances.

My conclusions are:

1. Exposure to high explosives may produce rupture of the membrana tympani. This rupture may occur at any part of the membrane. It varies in size, and two perforations are occasionally seen. Small perforations are most frequent, but there may be a large perforation, and in one of these the malleus was driven back.

2. The rupture in the membrana tympani tends in most cases to spontaneous closure. Its non-closure is usually due to its large size, or middle-ear suppuration following the rupture. Appropriate treatment hastens healing and diminishes the risk of suppuration. Adhesion of the malleus to the internal wall of the middle ear is frequent.

3. Concussion of the internal ear with nerve deafness and equilibrium disturbances occurs with or without rupture. In many cases the concussion passes off with slight damages to hearing, though equilibrium disturbances may persist for a considerable period.

4. The concussion may pass off, leaving an injured nerve mechanism demonstrable by (*a*) nerve deafness of a varying degree; (*b*) defect of equilibrium. The subsequent history of these will be referred to in the report of the cases observed at the West Cliff Hospital.

5. The treatment of recent perforated membrane which gives most satisfactory results aims at leaving the blood clot over the perforation intact. The following has been found satisfactory: A plug of cotton is placed in the meatus, and the lobe of the ear is cleaned and dried. The plug is removed, and then the outer part of the external meatus is cleaned by pledgets of cotton dipped in hydrogen peroxide. The meatus is then dried, and washed with pledgets dipped in alcohol and again dried. A piece of sterile cotton is then placed in the ear.

6. All the cases ought to be kept in bed for at least ten days to allow effects of the concussion to subside.

7. High explosives may cause a definite injury to the ear and its central connexions. The diagnosis requires considerable experience. A considerable proportion of the cases seen with deafness following exposure to high explosives had no sure definite trauma demonstrable, and the deafness present was accounted for by some other cause. Speedy recognition of those so injured by high explosives, with treatment, means more rapid recovery of hearing, diminution of the subjective symptoms of vertigo, so apt to persist, and subsequent usefulness. In view of these facts, an otologist of experience ought to be available at appropriate centres.

8. Apart from such injuries there were frequently seen cases of deafness or ear disease in which removal to the base was unnecessary—for example, wax in the ear, furunculosis in the canal, or slight serous discharge from old perforations; and cases where delay in treatment involved in transportation to the bases has aggravated the disease and delayed the recovery—for example, acute middle-ear disease. In such cases an otologist ought to be available.

A NOTE ON THE PREVENTION OF PEDICULOSIS.

BY

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THAT, under certain conditions of warfare, the difficulty of keeping the soldier free from pediculosis is a matter of great difficulty, is now too well known to require comment; and the prevention of pediculosis is of importance not only on account of the distress which the condition directly causes, but also by reason of the part it may play in the dissemination of disease.

A method of prophylaxis which I adopted nearly two years ago has perhaps some elements of novelty. Early in 1915 I learnt from officers and men who had taken part in the previous winter campaign that simple cleanliness, however scrupulous, was, under certain conditions, inadequate to prevent infection by pediculi. It appeared clear that some antiparasitic prophylactic was necessary.

The possibility which seemed at first practical and most likely of success was to obtain some solution of a parasiticide substance in a volatile solvent which could be sprayed on those parts of underclothing chiefly haunted by the parasite. While I was investigating a spray for this purpose, Mrs. Arthur Thomson brought me some undervests, which were being made by a work party in Oxford for distribution to soldiers, with the query whether they could be dipped, previous to distribution, in some antiparasitic solution. Those undervests were made of a material called butter-muslin, which is very thin and light and so cheap that I believe the intention was that the garments could be thrown away after being worn once. With such a tenuous material it appeared likely that dipping of the whole garment might be adopted without the use of such a quantity of solution as to render the cost prohibitive for wide use. There are, of course, other drawbacks to dipping the usual types of underwear in solutions of any kind.

From a consideration of such literature as was immediately available to me, the parasiticides which appeared most promising were naphthalene and sulphur, and, after some experiments, I finally adopted a solution of naphthalene and sulphur, 1 per cent. of each, in benzol. This solution, at first intended as a spray, was now used to dip the undervests; though it could still be used as a spray. When the undervests are dipped in this solution and wrung, the benzol, of course, evaporates in a few minutes and leaves the garments impregnated with sulphur and naphthalene in minute particles. I found that undervests so treated did not cause any irritation when worn next the skin, and that they retained the naphthalene and sulphur sufficiently long for practical purposes. By this method those substances not merely are deposited on the surface of the garment, but actually penetrate the fibre.

The cost of such an undervest in the spring of 1915 was about fourpence; and the cost of dipping, when batches of about fifty were done at a time, was about one farthing a garment. Owing to the increase in prices the cost both of the garment and of the dipping has about doubled when the various materials are privately purchased.

Benzol, which was first used, later became unobtainable, and the second grade of petrol was used instead. The latter does not seem to be quite such a good solvent, especially for sulphur; but in either case it is well to allow at least twenty-four hours for solution, the substances being used in fine powder. The solution can be made with sufficient accuracy by using an ounce and a half each of naphthalene and sulphur to one gallon of benzol or petrol. Solution may not be quite complete. The quicker the manipulation the larger the number of garments that can be dipped in a given quantity of solution; and various devices towards such economy will suggest themselves.

Undervests of this material are very comfortable to wear. Owing to their thinness they do not, in cold climates, constitute an undesirable addition to ordinary underwear; and in tropical climates I believe they have been worn alone. Impregnation with sulphur and naphthalene does not give rise to such an objectionable aroma as one might imagine. It would be an obvious advantage, for more complete protection, to have pants made and treated in the same way, and I understand that this is now frequently done.

Since June, 1915, undervests of this material and dipped in this way have been sent out in large numbers to officers and men at the seats of war. Those who received them were requested to return a report as to their value in preventing infection by pediculi. I should have published this note at an earlier date but for the fact that my knowledge was based largely upon hearsay. There was the obvious source of fallacy that men who received the garments as a gift would not perhaps care to send back adverse reports. I am indebted to Mrs. Gorrans not only for taking the actual dipping in hand, but also for her trouble in corresponding with the men who have received the vests. She has now distributed some thousands of these garments. The testimony of officers and men has been so unanimous in favour of the high or complete protection which these vests have afforded against *Pediculus corporis* that I feel that further hesitation in making the method more widely known may be unjustifiable. In any case this note may relieve me of further correspondence on the subject.

I have no personal knowledge of other methods which may be in use for the same object, but from recent evidence I am inclined to think that such as are in use are not entirely successful. Some weeks ago two officers admitted to my wards suffering from trench fever complained of having been infested with pediculi, and incidentally remarked that the only officer who seemed to

escape infection was one who was wearing one of the vests above described.

The experiments and observations of Kinloch and others have also shown that naphthalene possesses a high value in killing and warding off pediculi; its use for this purpose is, of course, not new. The value of sulphur, which one thought was established, has, however, been disputed. Nevertheless I have retained it, for two reasons. In the first place I hoped it might prevent the generalized spread of scabies, another parasitic disease which has been prevalent at home and abroad; and there is some evidence in favour of this view. In the second place, I am not yet convinced that sulphur is quite innocuous to the pediculus. This conclusion cannot, for instance, be drawn from the fact that the louse can remain alive on sulphur ointment. It is only when sulphur is changed into sulphides that it becomes active; and, at ordinary temperatures, the concentration of vapour of sulphide over sulphur ointment must be small. When, however, sulphur in the state of fine division in which it is precipitated from benzol is left in contact with the skin and therefore at body temperature, the vapour of sulphide, partly prevented from escape by surrounding garments, may reach a concentration sufficiently high to be injurious to the pediculus.

Dipping the garment in a solution of sulphur and naphthalene in benzol has advantages over merely sprinkling the garment with the same substances in powder (1) because the distribution of the powder is uniform and universal, (2) because, being impregnated in the fibre of the garment, it is longer retained, and (3) because the treatment is not left to the soldier himself, who receives the garment already treated. I may add an extract from a letter recently received from an officer in France who has taken much trouble to report on the efficacy of these antiparasitic vests.

> The shirts are doing good work and there is quite a demand for them. The billets we occupy at present are not very clean and consequently scabies is quite common. For scabies the shirts are excellent. For lice they do the work, but in some cases take time before they actually kill the lice. For some days the latter lie dormant on the shirts before they die. One man showed me a shirt with over 200 dead on it. This is encouraging as to their efficacy.

From this letter and others it may be gathered that a man who receives a prophylactic vest tends to keep it in reserve until he is actually infected. With a restricted distribution of the garments this is unavoidable. Indeed it may be suggested, to prevent disappointment, that there is probably no practical method possible which will ensure that a man, sufficiently exposed to infection, will never be bitten by a louse. Also it is obvious that such a prophylactic as here suggested has a time limit, and unless a man has a continuous supply for use he will be reinfected. If, however, all the individuals of a group of soldiers living in close association were systematically provided with such a prophylactic, it might go far towards solving the problem of pediculosis and scabies among them. The problem involves not merely infection of the individual but his infecting, and being infected by, his comrades. A complete solution is possible only when prophylaxis applies to them all. Moreover, the infection of bedding, etc., is a further problem which can only be partly attacked by depriving the parasites of possible hosts.

The evidence upon which this note is based is not the result of direct observation, and suffers from all the defects that such want involves. On the other hand, I have no reason to suppose that reports received steadily since June, 1915, can all be misleading, and I think the method is worthy of a more extended trial. I should suggest, therefore, that it would be a valuable experiment to provide all the members of an associated group of soldiers with antiparasitic vests and to observe the result in regard to the prevention of pediculosis and scabies. It has not been found possible to perform such an experiment by private effort directed at home.

It is possible that some such device might find its uses in civil practice. It is at once a method of prevention and treatment. For example, my friend Captain Girdlestone has applied the vests in patients underneath plaster jackets. In the cases in which he has so far used these vests there have been no cases of pediculosis, and no skin irritation has been produced.

PRELIMINARY NOTE ON A NEW TREATMENT OF BRONCHIAL ASTHMA.

BY

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THIS communication refers to a particular treatment which I have recently been applying to certain selected cases of bronchial asthma. The patients have been free from all disease, other than the bronchial affection, and although more or less emphysema and bronchial catarrh have been present, they have not been of a high degree, or such as to create dyspnoea in the intervals of freedom (more or less) from the attacks.

I may be permitted, first of all, to make reference to the view as to the nature of bronchial asthma which I submitted in the course of a lecture on this subject in 1908.[1] It was to the effect that the asthmatic attack is a reaction on the part of the lungs to a toxic substance "either of distinctly pathological origin, or else a product of normal metabolism which gradually accumulates in the blood." In the following year Auer and Lewis,[2] of the Rockefeller Institute, showed that the lung of the guinea-pig in anaphylaxis presented conditions identical with those of bronchial asthma. They found the pulmonary distension to be due to imprisonment of the air in the alveoli from an intense bronchiolar constriction which was exclusively of peripheral origin. The symptoms could be relieved or averted by atropine. The anaphylactic nature of bronchial asthma has since then been expounded by Meltzer and many others, though the particular protein substance responsible is unknown. The various authorities also regard hay fever as an anaphylactic condition. Anaphylaxis does not attack the bronchial muscle in all animals, but it does so in man.

There are one or two points concerning anaphylaxis which require to be stated. It is generally believed that the reaction is one of extreme delicacy and very specific. So it is, but under certain conditions this specificity disappears, as has been clearly proved by the work of Dale,[3] who showed that if a guinea-pig be sensitized to several antigens simultaneously, and an anaphylactic reaction be subsequently induced by a fairly large dose of one of the antigens, the animal thereby may be made refractory to the other antigens. Again, he found that if an animal be immunized to an antigen by giving a certain number of doses subcutaneously at short intervals, the animal as a whole being thus rendered immune, yet the excised uterus, or other susceptible organ, remains sensitive, not only to the antigen, but also to other substances akin to the antigen—for instance, to sheep's serum, where horse's serum was employed for immunizing. As the organ becomes desensitized to a second dose of sheep's serum the genuine nature of the anaphylaxis is proved. In like manner Kraus, Doerr, and others showed that animals sensitized to their own lens protein were susceptible to lens protein in general. The fact that an animal may be itself insensitive while its excised organ remains sensitive is explained by the neutralization of the antigen in the blood by antibodies before it has had time to attach itself to the fixed cells of the organ. Certain of the above facts recall the Abderhalden reaction.

Just as animals may be sensitized with their own lens protein, so autosensitization may take place in the case of bronchial asthma. Another possible instance of autosensitization, according to Rosenau and Anderson, is eclampsia, due to placental protein.

In applying the foregoing considerations to the condition of bronchial asthma, it was necessary to select a substance for the purpose of immunizing, which, if it did not contain the actual anaphylactic protein poison, nevertheless might contain one nearly akin to it. This condition appeared to be fulfilled in the case of peptone. Certain experiments of Biedl and Kraus were of great interest in this connexion.[4] They obtained bronchial spasm in guinea-pigs after the administration of Witte peptone, and they claim to have produced an anti-anaphylaxis in serum-sensitized dogs by means of the same agent. They hold the Witte peptone to be identical with the anaphylactic poison.

The method I have been employing is immunization by the subcutaneous injection of a water solution of peptone.

Not being able to obtain Witte peptone, that of Armour was used. Other kinds may be as efficacious, but it is necessary to remember that the various brands of peptone on the market may differ considerably in composition and thus affect the results. To begin with, ½ gram of peptone dissolved in about 5 c.cm. distilled water at blood heat is injected at an interval of three or four days during the first week. The next week two injections, each of ⅝ gram, are similarly given, and in the third week two injections of 1 gram in 7 to 10 c.cm. water. In certain cases this may be sufficient; severer cases may require 1 gram weekly or bi-weekly for three weeks more. No apparent constitutional reaction follows, and, properly carried out, there should be little or no local reaction.

In the limited number of cases tried the results have surpassed expectation. In several cases of moderate asthma the symptoms have become perfectly quiescent, while others have greatly benefited. In one case three months have elapsed without any recurrence. Sometimes the effect is very rapid, the patient experiencing relief after one injection. Where attacks of great severity occurred every two or three months, a few weeks' treatment beforehand has caused the attack to abort. I hope to submit further details in a future communication.

REFERENCES.
[1] BRITISH MEDICAL JOURNAL, 1908, vol. ii. [2] *Journ. Amer. Med. Assoc.*, vol. liii, 1909, p. 453. [3] *Journ. Pharm. and Exp. Therap.*, vol. iv, 1912, p. 167. [4] *Wien. klin. Woch.*, No. 11.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE CAUSE OF DEATH IN ACUTE PNEUMONIA.

WHAT is the cause of death in acute pneumonia? This is a question I have often asked, and the usual reply is—"toxaemia" (that is, the effects of toxaemia).

I have often wondered why all symptoms suddenly disappear, respirations, pulse, and temperature become normal, whilst for a time the physical signs continue more or less the same. On asking why the symptoms disappear the reply is that the "toxaemia" is overcome.

The fact that the consolidation is still present after all symptoms have disappeared, and the sudden appearance of symptoms before the physical signs, seems to show clearly that the rapidity of respiration, etc., is not due to the local condition. The increased action of the heart in the early stage must be due, like the respiratory change, to stimulation of the nerve centres controlling these organs.

The question, How are these centres "stimulated"? suggests itself, and the answer again is, through "toxaemia"; then to narrow the subject further one asks, through what channel? The answer does not appear so easy, for the channel of the "toxaemia," general or local, must be discovered, since upon that answer, it seems to me, treatment greatly depends.

Are all these symptoms which suddenly disappear, leaving the local physical signs still present, due to a sudden neutralizing of the pneumococcus toxins (this seems improbable), or are they due to something else, and if so, what? Is it cessation of absorption due to sudden decrease of intraspinal pressure?

In the old books on the treatment of pneumonia bleeding was often advocated, to be frequently repeated, with the result that the patient often died. May not the underlying motive for the bleeding, however, have been to reduce pressure with the object of preventing exudation? And though the means of attaining the object aimed at appear to have been ineffective, the amelioration of symptoms which followed for a time was probably due to a temporary diminution of absorption of toxins, possibly through diminished intraspinal pressure.

Physicians of the last generation were certainly, as observers of clinical symptoms, equal to the present ones, allowing for the absence of to-day's scientific knowledge; and though they were often wrong, there was generally a substratum of truth to their procedures, and bleeding in acute pneumonia may be an illustration of a practical truth.

If the symptoms are due to a poisoning of the nerve centre, it may be assumed, reasoning by analogy as in the case of spinal meningitis, that the toxin is absorbed from the spinal canal, probably under pressure, as in that disease. If it is absorbed from the spinal canal under pressure, then decrease of pressure would lead to decrease of absorption and gradual or more or less sudden disappearance of the symptoms.

If decrease of pressure leads to such a desirable result, why not adopt the method of tapping the theca as in the treatment of spinal meningitis, and by so doing follow a rational method of treatment? It could do no harm. No surgeon would rely upon using autogenous vaccine made from the organisms of a septic abscess without draining the abscess and so preventing fresh supplies reaching the economy. Clearly the indication is to prevent absorption as far as possible, and nature will do the rest.

If the poison is, as I am inclined to think, absorbed by the nerve centres under pressure, thus producing the symptoms, then draining these centres through the spinal canal seems to me rational treatment; more especially because it is known that intraspinal pressure is frequently, if not always, increased in acute pneumonia, and because meningitis is, I believe, found in a very large percentage of fatal cases.

H. V. DREW, F.R.C.S.,
Captain R.A.M.C.
Tidworth Military Hospital.

ATROPINE IN EYE WORK.

THE case reported below illustrates one of the many bad tricks atropine is apt to play in eye work. No one will condemn this very valuable drug on account of its tricks, but we must bear them in mind when using it. Perhaps more mischief arises from its use in unsuspected high tension than from anything else. Again, all are familiar with its habit of causing irritation of the conjunctiva with oedema (usually in unhealthy eyes, as witness its association with sympathetic ophthalmia). Further, not long ago I ordered the ointment of atropine sulphate (*B.P.*) for insertion into the conjunctival sac of a child aged about 6 years, preparatory to estimation of the error of refraction. Within two hours of the first application and early in the day, the child fell into a deep, almost comatose, sleep, lasting nearly twenty-four hours. Again, there are cases of prolonged paralysis of accommodation after atropine, and at least one instance of lasting paralysis has been brought to my notice. In cataract extractions the mere use of one drop of liquor atropinae sulphatis will sometimes evoke an attack of temporary maniacal insanity.

The special case I wish to record, however, is that of an alarming change in cardiac and respiratory action which came over the patient twelve hours after such a drop had been used after extraction.

The patient was aged 71 years, and very nervous. About twelve hours after the operation, having felt sick and faint for some time, she complained of difficulty in swallowing, and became dyspnoeic. She was very pallid and cold. The front of the neck was swollen and puffy, especially on the side of the eye operated on. The other pupil was wide and reacted feebly. The pulse was 90, scarcely perceptible, and a little irregular. The breathing was of the Cheyne-Stokes type with short rest intervals. The patient was collapsed and gave every appearance of dying. Speech was feeble and indistinct, and swallowing almost impossible. Strychnine was administered hypodermically, gr. $\frac{1}{30}$, together with the usual remedies for collapse. Fortunately within an hour the breathing improved with the pulse, and the patient gradually recovered. Morphine, whether rightly or wrongly, was not given on account of the respiratory condition.

HORATIO MATTHEWS, M.D.,
Honorary Ophthalmic Surgeon to the Eastbourne Eye Infirmary.

AFTER-HISTORY OF THREE CASES OF INTESTINAL OBSTRUCTION.

CASE I was a woman of 40, who refused operation till late, with gangrenous intussusception and polypus. Resection performed and lateral anastomosis with third size Murphy's button, owing to contracted state of distal gut. This woman died five years later at an asylum, of meningitis. A *post-mortem* examination was unfortunately refused. During the five years she had no signs or symptoms of stricture.

Case II was a woman of 38, who also refused operation till late, with gangrenous femoral hernia. Resection was performed and end-to-end union with third size of Murphy's button; no larger size could be used. Up to the present date this case shows no sign of stricture.

Case III was a woman of 76, with strangulated femoral hernia. At operation a knuckle of gut was found, black, shiny, and filled out; it was freed and returned just short of the abdomen; it perforated on the fifth day, the fistula remaining open for three weeks and causing much excoriation and discomfort. The woman has had no trouble since and is now 81 years old.

Authorities have established that stitching should be done whenever possible, and in skilled hands it is reasonably rapid. In Cases I and II resection was done rapidly, and was thought to be the only chance of recovery. The Murphy's button gave no trouble, immediate or remote.

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Rhymney Cottage Hospital.

Reviews.

THE STUDY OF SOCIAL PHENOMENA.

DR. JAMIESON B. HURRY has followed up the line of thought he opened in his well-known work on *Vicious Circles in Disease* by a book on *Vicious Circles in Sociology*.[1] His hope is to be of assistance to reformers "by emphasizing the importance of analysing social problems into their constituent factors, and thus facilitating the discovery of the *locus minoris resistentiae*." At this point above all remedial measures can be applied with prospects of breaking up the morbid sequence, so that "the hound which had turned to hunt its own tail will once more follow the scent." Thus the vicious circle of poverty, impaired health, low wages, may in some cases be straightened out by a timely holiday; that of crime, loss of situation, indigence, by provision of suitable employment, and so forth. The visualization of the morbid process as well as of the suggested method of cure is facilitated by explanatory diagrams, and the little book seems more worthy of study than many much longer and more pretentious volumes.

A book which may be mentioned along with this, though it was published some time ago, is Professor BOWLEY'S work on the *Nature and Purpose of the Measurement of Social Phenomena*,[2] founded on a course of lectures given in the Faculty of Economics at London University in 1914. Its appeal to the general public is likely to be limited, but it deserves the careful attention of social workers and investigators. In the whole sphere of science there is probably no subject so rife with ambiguities of definition and other pitfalls for the unwary as modern statistical sociology. Regarding society as an organic whole, the statistician endeavours to give a quantitative description of all its parts, in the first place as a contribution to pure science, and secondly, with a view to the modification of unsatisfactory conditions in conformity with some social ideal. "On the one side, measurement should result in accurate and comprehensible description that makes possible the visualization of complex phenomena; on the other, it is necessary to the practical reformer that he may know the magnitude of the problem before him." The scope of the book can best be briefly indicated by the following list of main headings: The nation or society; relation of persons to areas; classification, industrial, by degree of dependence, by social position; classification by order, by incomes, individual family, nature of family income; production and consumption; the standard of living, conventional, minimum, the poverty line. Having analysed the available methods of classifying the individuals and families of a society as previously defined, the author shows how families typical of classes or occupying a numerically defined position in the economic scale are to be identified. In his last chapter he deals with economic progress, of which he considers there is no better test than that which shows what proportion of a nation are in poverty.

[1] *Vicious Circles in Sociology and Their Treatment*. By J. B. Hurry, M.A., M.D.Cantab. London: J. and A. Churchill. 1915. (Demy 8vo, pp. 34; 2 plates. 2s. net.)

[2] *The Nature and Purpose of the Measurement of Social Phenomena*. By A. L. Bowley, Sc.D. London: P. S. King and Sons. 1915. (Cr. 8vo, pp. 249. 3s. 6d. net.)

PHYSIOLOGY.

MEDICAL students engaged in the study of physiology are particularly well supplied with textbooks at the present time. No better or more interesting introduction to the whole subject than the *Principles of General Physiology* by Professor Bayliss can be imagined—a book combining depth of knowledge with wideness of vision in an unusual degree. In the same way Professor Starling's *Principles of Human Physiology* offers its readers a thoroughly clear and sound account of the subject written by one who has a first-hand knowledge of many branches of the science. Both these are books that will take the medical student as far as he may hope to go in the acquisition of his knowledge of physiology, and further than most examiners are likely to wish to take him.

We have before us a third excellent volume, the second edition of the *Essentials of Physiology*,[3] by Professor BAINBRIDGE and Dr. MENZIES, that sets out in a much smaller compass the main facts required by candidates for examinations in the subject. The book contains fifteen chapters, and by strict attention to business the authors have succeeded in covering the whole ground in a satisfactory manner. The text is clearly written, and its comprehension is aided by a large number of well chosen pictures and diagrams. It would perhaps be better if the magnifications at which some of the reproductions of microscopic pictures have been made were inserted, and in the descriptions of Figs. 10 and 11 the word "electro-magnets" should read "poles of the electro-magnet"; on page 30, line 2, the word "magnet" should read "pole." The book is well got up and printed, and may be recommended to medical students as a sound and trustworthy short textbook of physiology.

NOTES ON BOOKS.

A MOST sumptuous book on surgical bandaging is that published by Dr. WHITING of Philadelphia.[4] It is the outcome of a class held by the author in the University of Philadelphia, and has the consequent advantage of being thoroughly practical. It is intended for beginners, and accordingly the author has attempted to follow the course of each bandage in detail, so that the student, when studying the turns in the absence of a teacher, may not make false ones which must be corrected later. The book is full of excellent reproductions of photographs taken from life. The author had the edges of his bandages blackened so that the lines of the turns show up perfectly in the half-tone reproductions. The success of the method is undoubted, and far more effective than the usual diagrams. On one point the reader must be wary: the author states that the art of bandaging has deteriorated from the too prevalent use of the gauze roller, and strongly recommends that muslin be used by all beginners. Muslin in England is a very flimsy tissue, and it is evident from the illustrations that some stout material is intended; we understand that what the Americans designate as "unbleached muslin" is known in this country as "unbleached calico."

A Textbook of Histology,[5] by Mr. H. E. JORDAN, of the University of Virginia, and Dr. J. S. FERGUSON, of Cornell University, is a sound and conservative exposition of the subject that contains all the medical student needs to know about it. Some of the illustrations are excellent; others, however, including most of the photomicrographs, leave much to be desired, a fault for which neither the paper nor the printer can be blamed.

How to take Care of Your Teeth[6] is a short and well written little book specially addressed to soldiers and

[3] *Essentials of Physiology*. By F. A. Bainbridge, M.A., M.D.Cantab., D.Sc.Lond., F.R.C.P., and J. Ackworth Menzies, M.A.Dunelm., M.D. Edin. Second edition. London: Longmans, Green and Co. 1916. (Demy 8vo, pp. 486; 173 figures. 12s. 6d. net.)

[4] *Bandaging*. By A. D. Whiting, M.D. Philadelphia and London: W. B. Saunders Co. 1916. (Post 8vo, pp. 151. 6s. net.)

[5] *A Textbook of Histology*. By Harvey Ernest Jordan, A.M., Ph.D., and Jeremiah S. Ferguson, M.Sc., M.D. London and New York: D. Appleton and Co. 1916. (Demy 8vo, pp. 837; 594 illustrations in text and 4 plates. 15s. net.)

[6] *How to take Care of Your Teeth*. With a chapter on the Care of the Feet. Specially written for soldiers and sailors by H. E. Sykes-Brown; foreword by J. Sim Wallace, D.Sc., M.D., L.D.S. Soldiers' Handbook Series. London: Forster Groom and Co., Ltd. (Cr. 16mo, pp. 73. 1s. net.)

sailors, who will find simple and practical directions for the care of gums and teeth threatened with infection or already suffering from it. For long there has been a crying need for books such as this. Mr. SYKES-BROWN is to be congratulated on the success with which he has attempted to satisfy this need.

MEDICAL AND SURGICAL APPLIANCES.

Table for Armless Soldiers.

WE are indebted to the Munitions Inventions Department (Ministry of Munitions) for the following description and drawings of a table invented by Mr. C. A. Sheehan for the use of soldiers who have lost both arms. In cases where the stumps are too short for the fitting of a satisfactory artificial arm of the usual type, such a table will enable a man to occupy himself during the absence of his attendant, and as he gains the necessary dexterity it should be possible for him to feed himself, perform various operations, and write. Fig. 1 is a front view of the table, and Fig. 2 a sectional view showing the arrangement of the turntable with its ball bearings and central leg, and of the sliding platform with its actuating lever. Fig. 3 is a plan view of the complete table. Figs. 4, 5, and 6 show

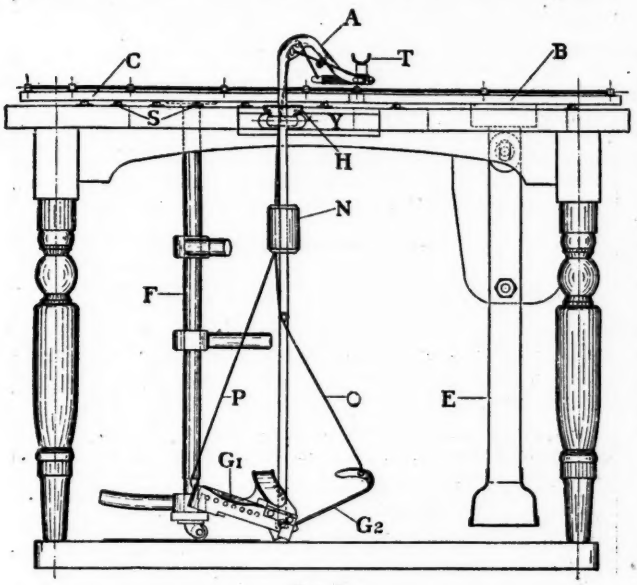

FIG. 1.

details. The appliance is operated chiefly by the use of the legs and feet, with the occasional assistance of the head. The operator sits in front of the table with the mechanical

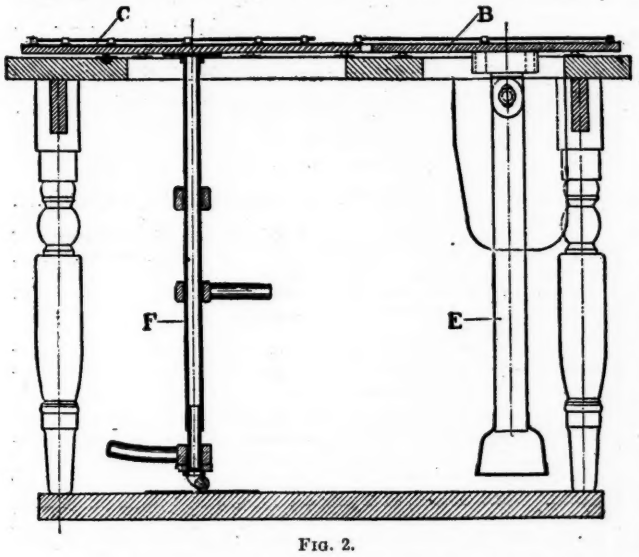

FIG. 2.

arm A before him, and is thus able to move the sliding platform B by means of the lever E, and the turntable C by means of the leg F, so as to bring objects on them within reach of the tongs, D, of the arm. The turntable C rests on ball bearings, S, and can thus rotate and also move slightly in a linear direction in the plane of the table. The tongs

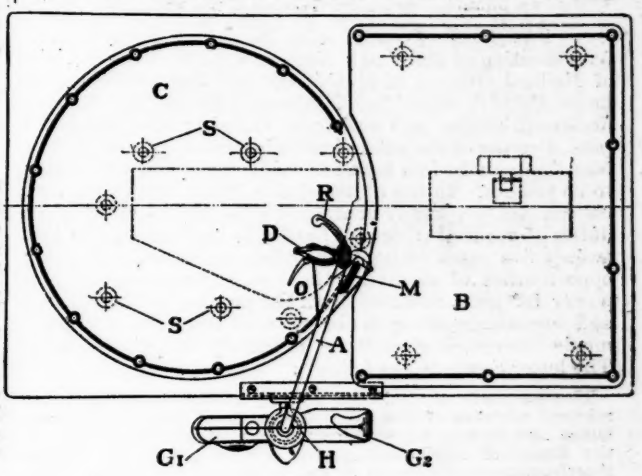

FIG. 3.

are controlled and the arm moved by the ball of the operator's foot, which is placed in one of the shoes G_1 or G_2; pressure on the shoe G_2 opens the tongs (which are normally held closed by a spring M and a weight N) by means of a flexible wire, O, passing over guide pulleys. On releasing the pressure on the shoe G_2 the sliding weight N falls and closes the tong jaws with sufficient grip for most purposes without any force being exerted by the operator. If, however, a specially strong grip is required, it is obtained by pressure on the shoe G, which forcibly closes the jaws by means of a flexible wire connexion, P, fixed to the weight N. The arm, which is a rigid, inverted L-shaped member, is universally suspended by a ball and socket joint H, so that by appropriate motions of the foot the arm can be twisted or raised in practically any direction. An article gripped in the jaws can thus be raised even to the top of the head of the operator. The ball and socket joint H, together with the arm A, can be moved slightly relatively to the table along a slide. Vessels

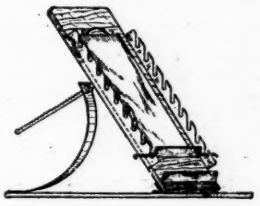

FIG. 4.

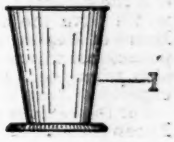

FIG. 5.

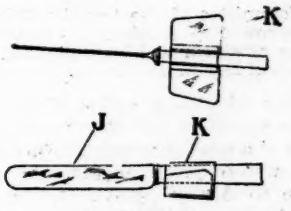

FIG. 6.

and cutlery for use with the table require to be specially shaped or adapted in order that they may be firmly gripped by the tongs; for example, the cup (Fig. 5) is a conical vessel, and is gripped close to the bottom flange, and the knife J (Fig. 6) is held by the rubber-faced attachment K. A sheet metal attachment, B, is provided on the arm A for turning over the pages of a book, and for dealing with sheets of paper, and a shaped attachment, T, for a cigarette, etc., is provided. Fig. 4 shows a writing easel. The writing-pad is laid on the front face after having been folded round a wire frame, projections of which rest in the notches of the plates, so that the frame can be pushed up notch by notch as each line of writing is completed; the easel is hinged at the bottom and supported by a saw-toothed bar resting on a curved spring. Under the pressure of the pencil, which is held in the tongs, the easel yields slightly, and this movement facilitates the formation of the upstrokes necessary in writing.

PROPOSED MINISTRY OF HEALTH.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

The Need of an Elected Board of Health.

AT a meeting of the North-Western Branch of the Society of Medical Officers of Health on April 2nd, at which the proposals with regard to a Ministry of Public Health were discussed, a letter was read from Professor Sheridan Delépine, director of the public health laboratory, University of Manchester, who had been invited to speak, but was unable to be present. In the course of this letter he recalled that though not personally concerned with the administrative duties of medical officers of health, he had during the last twenty-five years, owing to his official position, had many opportunities of observing the loss of time, money, and power for good, resulting from the present unco-ordinated and sometimes antagonistic state of the various departments interested directly or indirectly in public health. The letter continued as follows:

> These sources of weakness, serious as they were when the medical advisers of the Local Government Board and Home Office had to contend with only a few Departments, such as the Board of Agriculture, have become intensified by the interference of the Board of Education and the Departments responsible for the administration of the National Insurance Act.
>
> It appears to me that this unsatisfactory state of things is in great part the result of political influences which should not have the power to affect a new Department, the function of which would be to promote the Health of the Community.
>
> The Society of Medical Officers of Health should exert all its influence to modify a state of things which makes it possible for irresponsible advice to outweigh the views of those best acquainted with the various aspects of administrative and scientific problems bearing upon Public Health.
>
> I would therefore suggest that the institution of a Ministry of Public Health should not be considered independently of the formation of a representative Board of Health.
>
> By representative Board of Health I mean a Board to which, in addition to *ex officio* representatives of the Local Government Board, Home Office, Board of Education, etc., members would be elected by bodies such as the Society of Medical Officers of Health, British Medical Association, the General Medical Council, the Universities, the Society of Civil Engineers, the Institute of Chemistry, etc., in numbers proportional to the importance of their work in connexion with Public Health. (Such a Board would in all probability appoint an executive committee at suitable intervals.)
>
> The Minister, who would, as in the past, be appointed by the Government, partly on political grounds and partly on account of some general acquaintance with the work of his Department, would have the benefit of advice of the experts forming the Board of Health, both in connexion with the appointment of permanent expert members of the staff of his department, and also when new problems required a more wide and varied experience than any single expert could command.
>
> For the reasons which I have just stated briefly I would, had I been present, have moved:
>
> 1. That the creation of a Ministry of Public Health is desirable.
> 2. That the creation of a representative Board of Health is essential.
> 3. That a Committee of the Society of Medical Officers of Health be appointed to consider the means by which these objects can be attained, and an adequate representation of Medical Officers of Health be secured.

The meeting adopted a series of resolutions for submission to the council of the society, one of them advising the formation of a special committee to consider the whole question and watch developments. At a meeting of the council of the society on April 20th the recommendation was approved and a special committee appointed.

LONDON INSURANCE COMMITTEE.

At the meeting of the London Insurance Committee on April 26th Mr. H. KINGSLEY WOOD, L.C.C., moved:

> That the Insurance Committee of the County of London would welcome the formation of a Ministry of Health, and are of opinion that such Ministry should be entirely dissociated from the Local Government Board, but should, with the National Health Insurance organizations as an integral part, unify the existing Health Departments of the country; and that for this object the Committee do respectfully urge upon His Majesty's Government to set up a Representative Committee to investigate and advise upon the best methods that should be adopted, and that a copy of this resolution be forwarded to the Prime Minister.

He expressed the hope that the projected Ministry would not be a Ministry in the ordinary sense, liable to the usual political vicissitudes, and that in the selection of its head the precedent followed in the choice of the present Minister of Education would be followed. He did not wish to see all the power concentrated in the permanent undersecretary; some council or committee should be set up and invested with more than advisory powers. The Ministry should be dissociated from the Local Government Board, because the Board had already in hand too vast a number of undertakings; because its long record of failure in public health matters disentitled it to assume that it should be the principal heath authority; and because its association with the Poor Law would prejudice it from the beginning. Mr. COYSH, who seconded, thought that the mover had laid too much stress upon the prejudice likely to be created by the association of the Local Government Board with the Poor Law. Dr. H. H. MILLS, Chairman of the Medical Service Subcommittee, contested the allegation that the Local Government Board had been a failure in matters of public health, and described the Ministry of Health as being at present only a newspaper project. Sir EDWARD SMITH said that while every one would welcome the reform of public health administration he himself felt sceptical as to any practical result from the proposals now made. He considered the motion inopportune, unnecessary, and unwise, and proposed an amendment referring the whole matter to a subcommittee. Dr. LAURISTON SHAW agreed, but asked the subcommittee not to bring up a recommendation so absolutely impossible as that embodied in the motion—namely, that the work of the Ministry of Health should be dissociated from that of the Local Government Board. It was all very well also to talk of unification, but specialization had to be considered. Mr. KINGSLEY WOOD accepted Sir Edward Smith's amendment, which was agreed to.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUND.

THE following donations for the Officers' Benevolent Branch have been received during the quarter ending March 31st:

Sum of £180.—Officers' Mess, Ripon Training Centre.
Sum of £100.—Dr. J. Douglas (New York), per Sir William Osler, Bt.
Sum of £63.—Per Lieutenant-Colonel Sir William Osler, Bt.
Sum of £50.—Birr Training Centre Officers' Mess.
Sum of £48 6s.—Officers' 3rd Northern General Hospital.
Sums of £25.—Mr. G. R. Footner, F.R.C.S., Lieutenant-Colonel H. Littlewood.
Sums of £21.—Lieutenant-Colonel Sir William Cheyne, Bt., Captain J. H. Walker.
Sums of £10 10s.—Officers R.A.M.C., Lichfield; Captain F. Balkwell.
Sums of £10.—Major R. Lawford Knaggs, Captain Sir John Broadbent, Bt.
Sum of £6 6s.—Sir Rickman Godlee, Bt.
Sums of £5 5s.—Colonel Astley V. Clark, Lieutenant-Colonel R. Pemberton, I.M.S., Major A. Martin Leake, V.C., Captains A. E. Barclay, R. Ellis, Dr. F. H. Wood (per Lieutenant-Colonel Collier), and P. D. H. S.
Sums of £5.—Colonel C. A. Ballance, C.B., M.V.O., Major H. Pickering, Dr. R. Clement Duke, Dr. J. Stewart (Leeds).
Sum of £4 4s.—Captain J. Fawcett.
Sum of £2 12s. 6d.—Rev. A. H. Johnson (per Lieutenant-Colonel Collier).
Sums of £2 2s.—Major W. S. Telling (Leeds), Captains W. Longley, H. Williamson.
Sums of £1 1s.—Captains W. A. Alexander, R. O. Brownson, J. J. Crawford, J. Hill, J. Hendry, C. Irving, J. Kirton, L. A. Lewis, P. E. Lones, J. B. Minch, G. A. D. McArthur, H. F. Mullan, P. W. Moone, J. Polter, Lieutenants E. Baldwin, J. P. Crawford, M. M. Cummins, R. B. Eadie, T. P. Hutchinson, F. W. O'Regan.
Sums of £1.—Captains B. Carter, Pigot, Waddington, Lieutenant A. C. Mackay, Mr. H. M. Dowler, Rev. A. E. B. Leachy.

THE post of Director of the Institute for Experimental Therapy and of the Georg-Speyer House in Frankfurt-a.-Main, left vacant more than a year and a half ago by the death of Professor Ehrlich, has been given to Professor Kolle. He was one of Koch's pupils, and was his assistant when he investigated the causes of rinderpest in British South-West Africa in 1896. Kolle was then only 28. In conjunction with Pfeiffer, he investigated the problems of typhoid immunization, and the typhoid vaccine experiments carried out at the time of the Herero rising were continued during the present war. He has also made observations on cholera, plague, and dysentery.

ALKALOIDS IN COLLOIDAL FORM.

CONSIDERABLE progress has been made during recent years in the production of substances in colloid form for use in medicine.* Colloidal preparations of the metals, of which those of silver and mercury are the best known, were followed by the manufacture of colloidal preparations of iodine and sulphur, and the principle has now been extended, we are informed, to alkaloids by the Crookes Laboratories, in which most of the work on the subject in this country has been done. The belief in the therapeutic value of these preparations depends upon the theory that as the body fluids and tissues are in the colloid state it is necessary that the drug, before exerting its full therapeutic action, should be converted into the same condition. On this assumption it is argued that the prior preparation of drugs in the colloid state will avoid delay and waste in the conversion of a molecular solution into a colloidal solution by the action of the body fluids. Experiments, we are informed, are in progress in the Crookes Laboratories with preparations of the alkaloids of quinine, morphine, and cocaine in colloid form. Cocaine and quinine can now be supplied.

Laboratory experiments on the toxicity and on the anaesthetic properties of colloidal cocaine have been carried out at King's College, London, by Professor W. J. Simpson, C.M.G., and Professor R. Tanner Hewlett, and at Guy's Hospital by Dr. John Eyre, director of the bacteriological laboratory there. The following reports have been placed at our disposal by the Crookes Laboratories:

Report by Professors Simpson and Hewlett.

The following experiments were performed:

TESTS OF TOXICITY.

1 per cent. of Collosol Cocaine.	*1 per cent. Cocaine Hydrochloride.*
I. *Rabbit No. 4.*—Weight 3,270 grams; 0.26 c.cm. injected intravenously. No effect. (March 13th.)	I. *Rabbit No. 3.*—Weight 2,070 grams; 0.20 c.cm. injected intravenously. No effect. (March 13th.)
II. *Rabbit No. 4.*—0.75 c.cm. injected intravenously. No effect. (March 13th.)	II. *Rabbit No. 3.*—0.5 c.cm. injected intravenously. No effect. (March 13th.)
III. *Rabbit No. 4.*—5.0 c.cm. injected intravenously. No effect. (March 15th.)	III. *Rabbit No. 3.*—3.0 c.cm. injected intravenously. Immediately after injection the animal collapsed and became insensible; five minutes later convulsive twitchings, eyes insensitive. Ten minutes, recovering, but weak on hind legs and eyes now sensitive. Fifteen minutes practically recovered. (March 15th.)
IV. *Rabbit No. 3.*—3 c.cm. injected intravenously. No effect. (March 16th.)	IV. *Rabbit No. 4.*—5 c.cm. injected intravenously. Collapsed immediately after injection, with slight twitching, and died almost at once. (March 16th.)
V. *Rabbit No. 6.*—Weight 2,770 grams. 5 c.cm. injected intravenously. No effect.	V. *Rabbit No. 3.*—3 c.cm. injected intravenously. Immediately collapsed and died. (March 19th.)
VI. *Rabbit No. 6.*—10 c.cm. injected intravenously. No effect. (March 19th.)	VI. *Rabbit No. 5.*—Weight 2,750 grams. 3.5 c.cm. injected intravenously. Immediately after injection was convulsed and died almost at once. (March 19th.)

From these tests of toxicity we find that about 3 c.cm. of a 1 per cent. solution of ordinary cocaine hydrochloride (equivalent to about ½ grain) is a fatal dose for a rabbit of 2,000 to 3,000 grams weight, injected intravenously.

As regards the collosol cocaine, 10 c.cm. of the 1 per cent. preparation (equivalent to about 1.6 grains) produced no toxic effect whatever.

W. J. SIMPSON,
R. T. HEWLETT.

King's College, London,
March 23rd, 1917.

Dr. Eyre's Report on Collosol Cocaine 1 per cent.

The following experiments were performed:

A. *Toxic Properties.*

A full-grown rabbit, weighing 2,000 grams, received on March 1st 2 c.cm. of collosol cocaine 1 per cent., intravenously, the injection being made at the rate of 1 c.cm. per minute. No immediate or remote effects were observed.

On March 12th the same rabbit received 15 c.cm. of the same solution intravenously within ten minutes. No immediate or remote effects were observed. Five hours later 3 c.cm. of the 1 per cent. solution of cocaine hydrochloride were injected at the rate of 1 c.cm. per minute. Just before the injection of the third cubic centimetre had been completed, the animal was seized with convulsions and died within a minute.

Identical results were obtained on two subsequent occasions. In my opinion, therefore, collosol cocaine can be regarded for all practical purposes as non-toxic.

B. *Anaesthetic Properties.*

1. Two drops of collosol cocaine dropped into the left eye of a rabbit produced mydriasis and complete anaesthesia in three minutes.

2. Two drops collosol cocaine instilled into the left eye of the human subject produced complete anaesthesia, and enabled me to remove a foreign body embedded in the cornea without pain. (I can personally vouch for the completeness of the anaesthesia, as the foreign body was embedded in my own cornea, and I removed it myself in front of the looking glass.)

3. 0.8 c.cm. collosol cocaine injected into the male urethra (a very nervous and sensitive patient) produced complete anaesthesia in five minutes, and permitting the passage of a 7.5 mm. urethroscope.

The above three representative examples indicate the nature of evidence which, in my opinion, establishes the claim of the Crookes's collosol cocaine, that it can be regarded as an efficient local anaesthetic.

JNO. EYRE.

Bacteriological Department, King's College,
April 21st, 1917.

Colloid preparations of cocaine and quinine, under the names collosol cocaine and collosol quinine, are now on sale by the Crookes Laboratories, 50, Elgin Crescent, London, W., for administration by the mouth or by injection, at prices mentioned in our advertisement columns. Collosol quinine is stated to be compatible with either an alkaline or an acid solution.

The notification by the Army Council that it intends to take possession of all stocks of certain salts of quinine may give additional importance to the use of the alkaloid in colloidal form. Crookes Laboratories state that 1 oz. of the alkaloid quinine will yield 100 oz. of the colloidal solution of quinine, and that the therapeutic effect of the colloidal alkaloid substance is three times as great as that of the alkaloid in molecular solution. If we understand the matter correctly, the claim is that 1 oz. of molecular quinine alkaloid will yield the equivalent of 3 oz. of colloidal quinine, and that this colloidal quinine has three times the therapeutic efficacy. If so, conversion of the stocks of quinine into the colloidal variety would be a great economy. If we have calculated correctly, the dose of colloidal quinine by the mouth would, at the prices given, cost from 1d. to 3d. and by intramuscular or intravenous injection about 1½d.

* The theory of colloidal solutions, which dates back to 1861, when Thomas Graham published his first papers, will be found in the BRITISH MEDICAL JOURNAL of February 3rd, 1912 p. 252.

CURATIVE WORKSHOPS.

EVERY day that the war continues adds to the number of cripples and maimed for whom the country must do the best that is possible. The future of these men is one of the gravest of the after-war problems. At the present moment there are ten military orthopaedic centres in the United Kingdom, each of which has, or soon will have, as an essential part of its equipment, a curative workshop. These workshops provide the maimed or partly paralysed soldier with regular occupation of an interesting kind whereby his energies are bent upon useful work and dormant functions of nerve and muscle are coaxed into activity. The beneficial effects of these curative industries are threefold—gymnastic, psychic, and economic. Thus the work supplies the particular curative exercises suitable to each case; the patient's interest is kept up by seeing something grow under his hand; and, lastly, a trade is learnt wherewith the man can afterwards support himself wholly or in part. The human aspect of the work is the key to its success. This is

amply shown by the report of the work of the military orthopaedic centres during the first three months of this year, which has been furnished to the Joint War Committee of the British Red Cross Society and Order of St. John of Jerusalem, by King Manuel. This report begins with an account in some detail of the military orthopaedic hospital at Shepherd's Bush, in the organization and working of which the author has taken great interest. Great activity has prevailed in all departments of this institution. In the curative workshops at the present time eighty men are at work. In appendices to the report the various forms of occupation are analysed, and the cash value of the patients' labours is set out in tables.

King Manuel next records his impressions of visits paid to the other orthopaedic centres in Great Britain and Ireland, each of which has had the benefit of his help and advice in the establishment of curative industries. Describing the progress up to date of Alder Hey Hospital, Liverpool, he pauses to pay a deserved compliment to the wonderful surgical work carried out there: "We must remember," says His Majesty, "that Liverpool is the 'nursing mother' of orthopaedic surgery in this country, and that hospital is perhaps more than any other under the direct supervision of Colonel Robert Jones."

In describing the Welsh Metropolitan War Hospital at Whitchurch, near Cardiff, he notes with satisfaction the proposal coming from Lieutenant-Colonel Lynn Thomas that one half of this hospital should be devoted to orthopaedics, pointing out that small orthopaedic departments dotted throughout the general hospitals are wrong in principle. As a result of the personal appeal of King Manuel at Cardiff a sum of £5,000 has been raised, mainly at the docks, which will be devoted to building curative workshops and a gymnasium. At the 2nd Northern General Hospital, Becketts Park, Leeds, a similar appeal, made with the co-operation of Sir Berkeley Moynihan, has produced the same sum, and it is probable that the appeal to be addressed to the people of Bristol on May 5th will secure the necessary funds for building workshops at the Beaufort War Hospital at Fishponds. The report notes that one of the branches of the curative industries —namely, basket making—has already been very successful at this institution. "The results obtained for stiff hands and fingers or paralysed fingers are simply extraordinary." It is evident that at each of these centres a strong tide of enthusiasm is running.

The two orthopaedic centres in Ireland are as yet in their beginnings, but the work of organization has started at the Military Orthopaedic Hospital, Blackrock, Dublin, and at the Ulster Volunteer Force Hospital, Belfast.

In Scotland the administrative work is in the hands of the Scottish branch of the British Red Cross Society, but a profitable conference at which various questions were settled has been held between King Manuel, Colonel Robert Jones, and Major Harold Stiles (who is Deputy Director of Military Orthopaedics in Scotland), with Sir George Beatson, chairman of the executive committee of the Scottish Branch of the British Red Cross.

At the Bangour War Hospital, Edinburgh, the curative workshops are reported to be small and crowded at present, and new ones are necessary. The electrical department at this institution, under Mr. Rankine, is stated to be exceptionally good. The Bellahouston Hospital, Glasgow, receives very warm praise, but the workshops are not yet in use. When they are finished the centre will be complete. The orthopaedic department at Oldmill Hospital, Aberdeen, is not so advanced as the other two Scottish centres.

The financial section of the report shows that the Joint Finance Committee of the British Red Cross Society and Order of St. John has so far granted £20,000 for orthopaedic purposes. In Cardiff, Leeds, and Liverpool, King Manuel has raised nearly £15,000 by public appeals. In each of these three centres the money obtained locally has been applied to the construction of buildings; the cost of the equipment will be met from the grants provided by the Joint Finance Committee. So far the largest sums of money have been spent upon the Shepherd's Bush Hospital, which has been organized and equipped with the idea that it should be a model for the other centres.

The report closes with certain general propositions. The author points out that there is already a committee (formed by the Red Cross Committee, Pensions Ministry, and War Office) appointed to deal with each of four classes of men discharged from the army, namely, paraplegics, those with advanced tuberculosis, neurasthenics, and epileptics. He suggests that it is desirable that orthopaedic cases should be placed under similar control. "We have to remember that orthopaedics will have a very great importance in the future, because with treatment and training the great majority" of the men "will or might become very useful citizens to their country"—unlike those in the other four classes. Lastly, he underlines the great importance of the curative workshops in each centre, and the valuable results which have already begun to flow from them. After expressing gratitude for the assistance of Sir Berkeley Moynihan, Colonel Lynn Thomas, Professor Paterson, Major H. Stiles, and Major Hey Groves, the report concludes: "I have no words to express my deep admiration for Colonel Robert Jones and for his work, which would be still more wonderful than it is if he had had a more free hand."

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee, held on Tuesday, April 17th, twenty cases were considered, and £163 granted to sixteen of the applicants. The following is a summary of some of the cases relieved:

L.R.C.P. and S.Edin., aged 81, married, who became totally deaf a few years ago, and consequently lost his practice. His wife is an invalid, aged 80. Has three daughters, two married; the youngest, aged 46, looks after her parents. Total income from all sources £89, and pays £28 in rent. High cost of living and illness have made it necessary to apply for help. Voted £26 in twelve instalments.

Daughter, aged 79, of M.D.Glasg. who died in 1867. For many years, and until recently, lived with an old friend, a dressmaker, and they shared their slender resources. The friend now dead. Only income 7s. 6d. a week from a distant relative, but this may cease any time. She has applied for the old age pension. Health very bad. Voted £5, and the case to be reconsidered shortly.

Widow, aged 48, of M.B.Aberd. who died in July, 1916. Applicant left without means, with three children, aged 10 to 13. Friends have helped to furnish a house, so that she may take in lodgers, but so far has not been very successful. Her husband, who practised in Persia, left carpets and curios there valued at £380, but these cannot be moved at present. There are, however, debts to the extent of £260. Voted £10.

Widow, aged 65, of M.R.C.S.Eng. who died in 1914. Was left with slender means, and has a delicate daughter. Has £30 from another charity, and about £20 from investments. She has recently had a stroke. Relieved three times, £36. Voted £15 in twelve instalments.

Daughter, aged 55, of M.R.C.S.Eng. who practised at Newport, Mon., and died in 1892. Applicant left unprovided for. She is blind in the left eye and the other is weak. Has recently had an internal operation. Only income a pension of £21 from another charity and help from the Guild. Relieved six times, £72. Voted £15 in twelve instalments.

Daughter, aged 64, of M.R.C.S.Eng. who died in 1853. Owing to ill health was obliged to live on her capital, now exhausted. Has an annuity of £25 from another charity and endeavours to make a little by keeping poultry, and a friend lends her a small house. Relieved four times, £36. Voted £6 in twelve instalments.

Widow, aged 47, of M.B.Edin. who practised at Ballindalloch and died in 1910. Applicant was left unprovided for with four young children. The eldest, aged 18, has now joined the army, and the others are still at school. Tries to make a living by taking lodgers, but not enough to live on. Relieved five times, £50. Voted £10 in two instalments.

Subscriptions may be sent to the Acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is now called upon, as a result of the war, to deal with many widows and children who, in happier times, would not have thought of asking for assistance. It is glad to receive secondhand clothing and household linen. The class of clothes most wanted is that suitable for boys and girls working in offices, for women, and for old men. The gifts should be sent to the secretary of the Guild, 43, Bolsover Street, W.

MESSRS. HARRY W. COX AND CO., LTD., of 159, Great Portland Street, London, W., have issued a leaflet on means for the protection of radiographers from the injurious effects of *x* rays. A copy will be sent, post free, on request.

British Medical Journal.

SATURDAY, MAY 5TH, 1917.

MEAT VERSUS CEREALS.

THE French Minister of Agriculture has issued an appeal to French farmers to raise more cattle. In the course of it he points out that statistics collected in December last showed that the number of animals, both fully grown and young, had seriously diminished. Though the institution of meatless days would do something to liberate larger supplies for the army the agriculturists ought to look to the future. During the summer young cattle could be raised on green food; and in reply to the argument that it would be very costly to keep the animals during the winter it was urged, first, that there would be a great demand for meat in the autumn and early winter; and, secondly, that there would be a large demand also for restocking the regions devastated by the Germans and recently reconquered for France. The question, therefore, before France is rather special owing to the existence of these regions.

The French policy is not directly applicable to ourselves. Grain has a far greater energy value when converted into flour and eaten by man than when eaten by cattle and converted into meat to be eaten by man. Everything, therefore, should be done throughout the world to promote the growing of grain rather than of meat, and the raising of cattle should be limited to grazing lands in various parts of the world where grain cannot be grown. When the cereal shortage is over, at the end of the war or before, the head of cattle could be quickly increased again. For the moment we are suffering from a shortage of wheat, although there is plenty in Canada waiting to be shipped; but by diverting the grain now fed to poultry, dogs, cattle, and horses not employed on work of vital importance, we seem able to command at present a sufficiency of maize, barley, oats, rye, and rice, and by diluting the wheat can thus keep up a supply of bread adequate to the workers' needs. No cereal is so good a food as oats; barley and maize also are splendid foods.

How long we can expect to maintain stocks of these alternative cereals is not clear. Apart from the submarine menace and the question of transport there seems to be approaching a danger of world shortage and world semi-famine. We cannot go on indefinitely taking the energies of mankind from food production and turning it over to the production of war material, to say nothing of the millions of men engaged for years in fighting, or of the loss of life or the loss of working power owing to disablement. Women may make good in agriculture up to a limit, but it is a risky business to deplete such grain-growing parts of the empire as Canada and Australia of its grain-growing manhood while the grain supplies of Russia, Rumania, and other countries cannot reach us. It would be a serious thing for America also to lessen its agricultural manhood on now entering into the war. Unfortunately agriculturists make the most stalwart soldiers, but a wise mode of conscription should avoid this danger. The remedy of the President of the Board of Agriculture can hardly have much effect in increasing the harvest this year in this country; he wants to increase the amount of arable land from nineteen million acres to twenty-seven million acres, and seems to imply that this would go a long way towards enabling us to grow at home 82 per cent. of all the food required. Mr. Lloyd George goes beyond the Board's figures of 300,000 acres and claims that a million extra acres have been tilled and these will yield two million tons of food! If this be cereal food it is a most important addition, for the total amount of cereals used in the years 1909–1913 was a little under five million tons. He said that the Government plan was to bring three million extra acres into cultivation in 1918, which would make us self-supporting. In the face of the shortage of labour Mr. Lloyd George seems an optimist. The farmer is to be persuaded to break up grass into arable land by the fixation of standard prices for a term of years. This is not the same thing as fixing maximum prices for cereals in a restricted market. The result of that plan in Germany was that it paid the farmer better to grind his cereals in his own grist mill and feed them to pigs and cattle. In this country there is evidence that the same danger has arisen. The price of meat must therefore be controlled, so that it pays the farmer better to sell his corn than to feed it to animals. This is a matter requiring immediate attention. The population will have to pay more for its food. It is most necessary that the land should be fully cultivated and as large a population as possible drawn back to healthy and happy agrarian life. The land policy of the governing classes in the past century has resulted in the slum city; 62 per cent. of the populations of Glasgow and Dundee live in two or three roomed tenements, with all the attended ills—loss of happiness in life, the terrible high infant mortality, the scourge of tuberculosis, etc.—ills which can only be remedied by a policy of reconstruction after the war, including not only the encouragement of agriculture but the establishment of factories in healthy spots surrounded by garden cities. This policy we have not yet seen brought into prominence by politician or publicist, yet it demands execution in as courageous a manner and with as unlimited scope as the management of the war. The war against disease is no less urgent and demands no less a national effort, and victory in it means not the waste of human endeavour but gain a thousandfold. Mr. Lloyd George, after receiving the freedom of the city, spoke eloquently at the Mansion House on party politics, which he seemed to think essential to the working of democracy. It is, he said, "a curious game whereby one set of men set themselves with all their strength, might, energy, thought, and ingenuity to thwart, embarrass, criticize, and overthrow another set of men who are trying to govern the country. But during a war such as this we must suspend all conflicts and concentrate upon the one great purpose. A war is like an illness. You cannot attend to the ordinary business and gains of life; you have to concentrate all on meeting the dread enemy that is eating your vitals. You have to concentrate all your strength, all your might, all your blood, all your brains, all your thought upon it."

It is strange that he seemed to have forgotten his own efforts to ameliorate disease or failed fully to remember that other war, the one which evil conditions wage against human life and happiness in peace time. How can one set of men set themselves out to thwart, and so on, another set of men who are trying to govern the country in the face of such facts as that infant mortality is 170 a 1,000 in certain large towns, and the victims of tuberculosis number 70,000 a year? Is there not national illness, "a dread enemy," eating at our vitals in peace time? Its very familiarity breeds such indifference that the pre-war

days of party government receive no censure from the Prime Minister. Is the outlook of pioneers in national hygiene and that of the politician still to remain poles asunder, or is the national life to receive a new birth by a complete reconstruction of the housing conditions of the people?

SMALL V.A.D. AND PRIVATE HOSPITALS.

THE Secretary of State for War has issued an appeal to nurses to meet the situation caused by the torpedoing of hospital ships by the enemy and the necessity for increasing the hospitals abroad. He recognizes that "as in the case of doctors, it is necessary to safeguard the welfare of the civil population at home, and that nurses should only be secured with the co-operation and good will of the authorities of every civil hospital, poor law infirmary, and institution supplying nurses." He therefore appeals to these authorities to review at once their present staffs, and to set free for military service every available certificated nurse willing to serve. He also appeals to every nurse who has retired to offer her services to her training school or to one of the local hospitals or institutions so as to release a nurse capable of undertaking the more strenuous duties of military service. He appeals also to those trained nurses who have left the military service to enrol themselves again. Every nurse who is in possession of a three-years' certificate for general training, and is free to offer her services, is asked to apply at once to the Matron in Chief, War Office, Adastral House, Embankment, London, E.C.4. Lord Derby concludes his urgent appeal by paying a tribute to the splendid work of nurses for the sick and wounded, and to the courage and devotion to duty displayed under fire in the field, and in mined and torpedoed hospital ships during this war. We do not doubt the generous response which will follow this appeal, but the supply of fully trained nurses is limited.

Lord Derby in his appeal refers to the need for safeguarding the welfare of the civil population, and this, as in the case of doctors, includes as an imperative necessity the special provision required by the Ministry of Munitions to be made in Government and controlled establishments for the making of munitions of war, and provision for maintaining the health of those engaged in the building of ships, and the general supply of the armies. It does not specifically include the needs of the military hospitals, large and small, in the United Kingdom. The needs of the military hospitals abroad are insistent, and it does not seem safe to assume that the military hospitals at home will feel any appreciable relief from the establishment of new units across the sea. The nursing members of the V.A.D. have already proved beyond a doubt their value to the base hospitals in France. Their zeal and devotion are beyond praise—that is well known to all who have seen them at work, and the same is true of the myriad ladies who pour out their time and energy in the service of the auxiliary hospitals at home. But in acknowledging the admirable way in which the amateur has supplemented the professional in military nursing, the question arises whether the time has not come for a review, in the interests of economy in both medical and nursing personnel, of the system of small scattered hospitals which has grown up. The War Office has recently invited County Associations to make new V.A.D. hospitals containing not less than forty beds for men or twenty for officers, but there can be little doubt that the multiplicity of small V.A.D. and private hospitals tends to cause overlapping, waste of effort, and uneconomical use of personnel, both nursing and medical. All must respect the local sentiment which seeks to find expression in local work for the wounded; but we are living now in grim, practical times, and efficiency and economy on the largest scale are needed in every department of life—more, perhaps, in the medical and nursing services than in any other. If this urgent need here and there overrides local sentiment, and deals rather roughly with individual susceptibilities, that price must be paid. If some of the smaller home hospitals were closed and others expanded and reorganized to take over their work, this would certainly set free a considerable number of trained nurses as well as V.A.D. nurses who have gained experience, to say nothing of other economies in personnel and equipment which would follow. The convalescent soldier recovering from sickness or wound no doubt appreciates the sheltered life in a little country hospital where he is waited upon by sympathetic ladies, and military discipline is not very strict; but for every soldier whose recovery is hastened in this way there must be many whose return to duty is delayed. The result of a readjustment of the present arrangement with regard to the smaller hospitals throughout the country might therefore, there is good reason to think, lead not only to an economy in medical and nursing personnel, but also be of direct benefit to the men themselves.

A FILTERABLE PHASE OF CERTAIN PATHOGENIC BACTERIA.

WE publish in this issue an important paper by Dr. Hort, which was communicated last week to the Royal Society, a paper in which his previous hypothesis is converted into a demonstration, and it is shown that certain pathogenic bacteria can under certain conditions give origin to viable and vegetative forms so minute as to come within the category of filterable viruses.

This in itself is a notable advance. Whether he is justified in entitling his communication "the life-history of bacteria" is another matter. It may well be asked if, because, by growth in strongly acid media, budding and branching forms make their appearance in addition to others presenting the usual binary fission, this affords proof that budding and branching are normal processes which are bound to appear sooner or later in the life-cycle of these members of the typhoid-coli group. What Hort has proved is, as above noted, that there are conditions under which outside the body it is possible to induce a process of gemmation. That the acidity of the medium by softening the cell membrane is an important factor in the production of the buds is probable, but that the process is one of true gemmation and not merely a form of plasmolytic extrusion is evidenced by the continued growth and subsequent fission of these buds, as observed in drop cultures under the microscope. We are doubtful whether some at least of the cruciform and allied forms shown in Mr. Martin Duncan's excellent photographs may not be due to superposition. There is, however, a symmetry and "rectangularity" in the greater number of these forms which makes it difficult to believe that we are not dealing with true branching, and by analogy with what has been abundantly shown to occur in the *B. tuberculosis*, *B. diphtheriae*, and other members of the "higher bacteria"; we are fully prepared to find

that this occurs, and to regard the whole family of the Schizomycetes (fission fungi) as potential or degenerate "Hyphomycetes."

But from the point of view of the pathologist these are secondary matters; what is of first importance is this demonstration by Dr. Hort that outside the body pathogenic bacteria are capable of giving off living units so minute as to be filterable. If this can occur outside the body, it is eminently likely that under the action of the body fluids and enzymes a like process may occur in the tissues, and that along these lines we may be enabled to solve some of the outstanding problems of pathogenic bacteriology.

THE FOOD PROBLEM IN GERMANY.

PROFESSOR LOEWY has published in the *Deutsche medizinische Wochenschrift* (February 8th and 15th, 1917) a review bristling with statistics of the food situation in Germany in 1916. He begins by criticizing Voit's estimate, published in 1881, that a mixed diet should contain 118 grams of protein,[1] 56 grams of fat, and about 500 grams of carbohydrate. Langworthy's figure for moderate work, from observations made in America, was, it may be remembered, 115 grams protein "as purchased," the energy value of the total food being 3,800 calories. Loewy's contention is that though this amount of protein has received the stamp of official approval it can be reduced by one-third, and even to 70 or 50 grams, without inevitably causing injurious effects. He gives the results of investigations made in April, 1916, on the feeding of 858 families, comprising 4,079 persons, and in July, of 146 families, comprising 644 persons. The figures for April gave 68.29 grams of protein, and the total diet yielded 2,320 calories a head. Loewy considers that "the composition of the diet of these families fulfilled all the requirements of modern food teachings." The Food Committee of the Royal Society reported, on the basis of statistics supplied by the Board of Trade, that the quantity of foodstuffs available in this country during the five years 1909–1913 gave 87 grams protein, 100 grams fat, and 440 grams carbohydrate, yielding 3,091 calories. From a rough calculation made by us shortly after the issue of the voluntary rationing order of the Food Controller we came to the conclusion that in ordinary middle-class households early this year the diet afforded in round numbers, protein 98 grams, fat 132 grams, carbohydrate 289 grams; yielding an energy value of 2,910 a head. In Berlin, in May, 1916, the official weekly ration consisted of 250 grams of meat, 90 grams of butter and margarine, 2 eggs, and 1,950 grams of bread. Every twelve days 250 grams of sugar and 5 kilos of potatoes were added, and the wives of soldiers, paupers, and persons out of work were given a monthly dole of ¾ lb. of rice and ½ lb. of beans. The protein value of these rations was only 36.3 grams, and the yield of calories 1,312. These rations, Loewy says, being absolutely inadequate, were supplemented by provisions purchased in the open market. Vegetables and fruit available, however, were of slight value, for, with the exception of spinach, their yield of protein and calories was very low. Honey and marmalade were available, but, though their calorie value was high, the limit of the amount which could be consumed was soon reached. Theoretically, the rations could be supplemented by fish, game, poultry, cheese, maize, oats, and barley, but in practice these foods were beyond the reach of the bulk of the people; either they cost too much or they disappeared when maximum prices were fixed, or—and this was the case with the non-ration cereals—the supply was inadequate. Finally, abandoning apparently the results of his examination of the diets of the two sets of families, Loewy comes to the conclusion that the calorie value of the diet of the average German in the spring and summer of 1916 was too low, being inadequate to meet the requirements of bodily exertion. He maintains that if the calorie value of the rations diet was raised to the required level, no special measures would be required with regard to the supply of protein. His final conclusion is that, owing to the insufficiency of the official rations, only by providing food at moderate prices in the open market could the supply be raised so as just to meet the needs of persons doing light work.

[1] Loewy uses the word "*Eiweiss*," albumin, although from the context it is evident he is referring to protein.

THE EAR IN MODERN WARFARE.

PROFESSOR GORDON WILSON, whose interesting paper on the effects of high explosives on the ear was published on March 17th, has now contributed a note upon some further observations he was enabled to make as an officer of the Canadian Army Medical Corps at a Canadian casualty clearing station and stationary hospital. In these units he saw cases shortly after the damage was inflicted. He concludes that exposure to high explosives may produce rupture of the tympanic membrane at any part. It is usually small, but may be large, and there may be more than one. The rupture in most cases tends to close spontaneously. With regard to the treatment of recent perforation, he says that the most satisfactory is that which aims at leaving the blood clot over the perforation intact. How he considers this may best be carried out will be seen by reference to his fifth conclusion on page 579, and he adds that all the cases ought to be kept in bed for at least ten days to allow the effects of the concussion to subside. Professor Kretschmann, who has recently published a long paper on the subject in the *Deutsche medizinische Wochenschrift* (January, 1917), also insists upon the avoidance of active treatment. He lays it down that blood clot should not be interfered with, and certainly should not be syringed, and that all that is necessary is to cover the external meatus with gauze and a bandage. In this respect he seems to be a less safe guide than Professor Gordon Wilson, but he agrees that the patient should be kept at rest in bed. Kretschmann attributes a large proportion of the cases of middle-ear suppuration following wounds of the tympanum in the German army to too active treatment. It may possibly be useful to add to Professor Gordon Wilson's conclusions Kretschmann's statement that when the tympanum escaped injury but the deeper structures of the auditory apparatus suffered, withdrawal of some blood in the region of the mastoid process was beneficial, particularly when the injury was some days old. Kretschmann also states that in cases of recent shell deafness he had found subcutaneous injections of pilocarpine beneficial, and thinks that in the absence of cardiac disease and gastro-intestinal catarrh they should be begun early. Apparently he believes that he sometimes got good results from the use of the galvanic current, but if no definite improvement followed six sittings he thinks it useless to continue. In this connexion we may refer to an interesting lecture given at the Royal Institution on April 27th by Dr. J. Dundas Grant on the organs of hearing and the war. It was illustrated by a large number of experiments and exhibits; the latter included at least one of historical interest in the shape of Helmholtz's model of the tympanic membrane and the ossicles. Dr. Grant said that defective hearing was always a drawback in military service, but a lack of acuteness in this respect might be made up to some extent by the exercise of the powers of attention and discrimination. The individual who could hear whispered words with each ear separately at a distance of 15 ft. was eligible for the ranks so far as hearing was concerned. No doubt deafness of one ear interfered with judgement as to the direction of sounds, but this difficulty did not arise to any great extent in the field, though in the French army complete deafness of one ear, even with good hearing on the

other side, removed a man from general to auxiliary service. Dr. Grant mentioned that he had recently seen two patients from the front who had been operated on many years previously for mastoid disease and cerebellar abscess resulting in one sided deafness. They had been in the fighting line for eighteen months and their impediment had not been observed. With regard to aviation, the ear tests for intending pilots were necessarily most exacting. It had been supposed that flying would induce vertigo, but Dr. Lacroix, of the French army, stated that among the numerous pilots he had examined vertigo was found only in two or three, and was traceable to a pre-existing condition. Dr. Grant said that as a result of an aeroplane voyage he himself had undertaken at a considerable height, he could confirm Dr. Lacroix's observation that as soon as the aviator left the ground the fear of vertigo disappeared. The effect of the noises at the front upon the hearing apparatus was not always what some might have expected, and there was good foundation for the statement of the French poilu that the noise of the guns did not annoy him nearly so much as the snoring of his mate. The so-called "whizz-bang," however, was particularly nerve-trying. The velocity of the projectile was greater than that of sound, so that the whizz of its passage was heard before the bang of the gun which sent it. Very severe damage had been done to the labyrinth as a result of air concussion due to a violent explosion, and it was usually by the bursting of a shell near at hand, and not by the continual dinning of the guns, that ear injuries were produced. Sometimes the labyrinth was saved by the giving way of the tympanic membrane; the force of the explosion expended itself in the tympanum instead of being communicated with great violence to the internal ear. The majority of the cases of deafness arising from concussion of the labyrinth recovered unless there was an actual wound. With regard to the prevention of deafness, such things as cotton-wool and wax were employed as ear protectors, but the experience of officers was that although these measures of precaution deadened the sound of bombardment, they made it impossible to hear orders at a short distance. The kind of protector which had proved the most effective in his experience was the Mallock-Armstrong plug, an ingenious contrivance designed by Mr. A. Mallock, F.R.S., and described in our columns in January, 1915. Dr. Grant concluded with an appeal for the absolutely deaf soldier who, he said, while not in so bad a case as his sightless comrade, was fully worthy of public commiseration. The only thing to do was to teach him lip-reading.

A VOICE FROM SPAIN IN PRAISE OF ENGLAND.

IT must be admitted, more perhaps in sorrow than in anger, that we are not loved by the Spaniards. Although the more enlightened classes recognize that the Allies are fighting for the deliverance of the world from a danger which was becoming ever more urgent as German ambitions waxed more aggressive their sympathy is bred in the head rather than in the heart. The unfriendly feeling of the majority of the Spanish people has been fostered by a carefully organized German propaganda which by appeals to ignorance and prejudice has enlisted clerical, military, social and commercial influences as aids in the furtherance of its aims. *Quidquid Germania mendax audet in historia* and the whole art of what Arbuthnot called "political lying" are brought to bear against us. But the propaganda would not be so successful if the soil had not been prepared long ago for the sowing of new seeds of distrust and enmity. We therefore welcome the appearance of a champion of our country in the person of Dr. José Armangué, a well known physician of Barcelona, whom we have the honour to count among our subscribers. In an article which appears in *La Publicidad* of March 27th he shows by a simple recital of facts how erroneous and absurd is the charge, sedulously spread by our enemies, that we have stood aloof from the active work of war and allowed other nations to fight for us. It needed no small courage on the part of a doctor to come forward as the advocate of an unpopular cause among the people to whose patronage he has to look for a living. How strong is the feeling against which Dr. Armangué raises his voice may be gathered from the opening sentence of his article: "The hereditary hatred of the English is very widespread in my country; hence I fear I shall offend the majority of my readers if I tell them I am an Anglophile." He goes on to say that he is a lover of England because it was the English who by the Revolution of 1688 set free the minds of men from the shackles that had bound them, and thereby made the whole world their debtors. Dr. Armangué then shows in detail the immensity of our effort and achievement in the present war. By its Navy, which holds the German fleet locked up in harbours and keeps Germany to a large extent cut off from the outer world; by the vast army created through the adoption of compulsory service, so contrary to all our traditions; by the prowess of its soldiers on many battlefields in different lands, and by the unstinted financial help given to her Allies, England has done more than her share in the war of "banded nations" against the common foe of humanity. Dr. Armangué's statement of the case is admirable in its accuracy and lucidity, and is all the more cogent from the moderation of its tone. We hope it will do something to clear away misconceptions which, if allowed to persist, must tend to make the future relations between England and Spain difficult if not positively unfriendly.

"CLEAN" MILK.

THE National Clean Milk Society was formed in 1915 with the object of improving the hygienic quality of milk. The methods adopted are, first, the education of the public to demand a pure milk supply, and secondly, the investigation of samples of milk. In continuance of its activities the society has now published a report of an investigation into the hygienic quality of the milk supplied to babies attending certain schools for mothers, together with some suggestions for those responsible for the feeding of children. Seven London schools for mothers supplied the names of twenty-seven dairymen from whom the majority of women attending these centres, who were unable to suckle their babies, bought their milk. A sample from each of these shops was taken in a sterile bottle and sent packed in ice to the Lister Institute, where each was examined for the total number of bacteria present, for the number of *B. coli* present, and for the presence of the tubercle bacillus. The examinations were conducted between July and November of last year. Of the twenty-seven samples, every one contained *B. coli*, and the total number of bacteria present varied from 93,000 per cubic centimetre to 104,300,000. Two samples showed microscopic evidence of the presence of tubercle bacillus, which was confirmed by guinea-pig test. An additional sample of milk sold by a London dairyman as "certified milk in clean bottles—direct from farm to customer," was found on examination to contain 12,500,000 bacteria per cubic centimetre, 280,000 *B. coli* in dilution, and tubercle bacilli confirmed by guinea-pig test. Of these twenty-eight samples of London milk, twenty contained more than a million bacteria per cubic centimetre, and twelve contained five million or more; the report unkindly points out that the number of bacteria found in the sewage of large towns varies between two and six million per cubic centimetre. An instructive comparison is then made between these figures and the statistics of certain American cities which have tackled the milk problem during the past twenty years. As the result of the steadily increasing effort by official and unofficial workers, the dairy industry in the United States is on a different plane from that in

England. In America milk is usually sold in grades based on its bacterial content. For example, in New York City, since the beginning of 1911, milk has been graded into (*a*) milk for infant feeding, (*b*) milk for adults to drink, and (*c*) milk for cooking purposes only; and the infant mortality figures since that date have shown a marked decrease, some of which must almost certainly be due to the improvement in the milk supply. During the period of 1906–10 the deaths of children under one year averaged 135.8 per thousand born; in 1911 the average was 111.6, and in 1915 it was 98.2. The report is timely, and should stimulate the demand for more vigorous action by the Government and the local authorities. The address of the National Clean Milk Society is 2, Soho Square, London, W.

GAS.

IT is rather curious that the word "gas" in two quite different senses should have reached the everyday vocabulary of disease during the early months of the war. First came gas gangrene, as it were out of the earth; then came drift gas and shell gas from the laboratories of *Kultur* behind the German lines. The result, we understand, has been some little verbal confusion in medical circles across the Channel. The surgeon speaks familiarly of "gas cases," meaning one thing, and the physician looks up from his copy of the BRITISH MEDICAL JOURNAL to find himself out of the conversation. The suggestion has even been made that the northern and southern pronunciations of this word should be used to discriminate between the two meanings. This reminds us of the story told by Sir James Murray in the preface to the *New English Dictionary*. He was once present at a meeting of a learned society where in the course of discussion he heard the word "gaseous" systematically pronounced in six different ways by as many different distinguished physicists.

THE RETENTION OF THE WHEAT GERM IN FLOUR.

CAPTAIN CHARLES BATHURST, M.P., Parliamentary Secretary of the Ministry of Food, presided over a meeting of the Royal Society of Arts, when Sir Francis Fox read a paper on the subject of bread and flour, which contained a strong plea for the retention of the wheat germ. It was the colouring germ, eliminated by the steel roller process of modern milling, which provided in a great measure the flavour and nourishment of the wheat. It was rich in protein and fat, and its presence or absence made a great difference alike in the palatability and nourishment of the bread made from the flour. Moreover, bread made from flour which contained the germ would remain fresh for days, while bread made from much of the roller-ground flour crumbled like sawdust within a much shorter time. The objection had been raised that the germ rendered the flour rancid if kept for long; leading millers not only denied this, but said that flour containing the germ would keep longer than flour without it. The new order by which the very white (or 70 per cent.) flour was prohibited and the percentage brought up compulsorily to 81, and the miller allowed voluntarily to take it up to 86, marked a great improvement. It was rumoured that in some cases the germ was still being extracted; this should be prohibited, as it materially diminished the food value of the flour. The recent bread was said by many to be much more palatable, and this was due in great measure to the retention of the germ, for although the percentage was only 1½, the influence of this ingredient did not depend upon the weight. Some of Sir Francis Fox's statements were freely contested by millers who were present, and who appeared to defend white flour, but the main contention of the paper was endorsed by Colonel Charles E. Cassal, who spoke from long experience as a public analyst, and said that valuable nutritive material was lost as a result of the rejection of the germ. He objected to the inclusion of maize among the articles which were permitted to be added to flour, though the same objection, he said, did not apply to barley or rye. Maize contained a certain amount of oil from which it could not be freed, and which, he believed, led to indigestion. Professor H. R. Kenwood said that he was not aware of any experiments which showed that 80 per cent. flour was less nutritious than 70 per cent., even after making allowance for the fact that there was rather more indigestible material in the former. A good set-off against the addition of this slight indigestible property in the 80 per cent. flour was the fact that it prevented constipation, and constipation was far more general than indigestion.

IT is announced that 1,000 medical men to be selected by the American College of Surgeons will shortly be available for service with the allied armies in France. Colonel T. H. Goodwin, C.M.G., D.S.O., A.M.S., who accompanies Mr. Balfour on his mission to the United States, has been in communication with the medical committee of the Council of National Defence with regard to the medical needs of the British army and the recruiting of American surgeons.

MANY members of the Association will have heard with personal regret of the serious assault committed recently upon Dr. J. M. Rattray, of Frome, for he was widely known not only in his own district (having been president of the Bath and Bristol Branch), but also because he was a frequent attendant at the annual meetings of the British Medical Association. It appears that Dr. Rattray, on April 21st, had been asked to see a resident in the neighbourhood. Finding him in a state of mental disorder, he advised that certain steps should be taken. The patient became worse during the night, and Dr. Rattray was summoned to him again early on the morning of April 22nd. The condition in which he found the patient led him to direct that a magistrate should be summoned, and the patient becoming aware of this obtained a short heavy sword, and with it struck Dr. Rattray a blow on the shoulder. He then obtained a rifle, with which he shot Dr. Rattray in the left shoulder at twenty paces. Dr. Rattray found refuge in the lodge, but the patient kept every one at bay with his rifle, so that it was impossible to go to the assistance of Dr. Rattray for four hours. He was then attended by Drs. Seddon and Harris of Frome, Dr. Evans of Beckington, and later on by Mr. James Swain of Bristol. It was found that the injury was of a very serious character, the bone being badly splintered. The patient was not secured until the assistance of the military was obtained. He was then removed wounded to hospital. Dr. Seddon was able to report on May 2nd as follows: "Dr. Rattray's progress is maintained; the flesh wound in the arm, which is freely drained, is healing in a very satisfactory manner. Several bony fragments were removed at the lower part of the humerus, but there is every sign that the cavity is doing well."

Medical Notes in Parliament.

The Venereal Diseases Bill.

THE Venereal Diseases Bill, as passed through the House of Lords and given second reading in the Commons, came before Grand Committee of the Commons on May 1st. Mr. J. W. Wilson presided. Mr. Hayes Fisher, Parliamentary Secretary to the Local Government Board, was in charge of the measure.

Areas without Venereal Schemes.

The intention is that the provisions—to prevent the treatment of venereal diseases and the supply of remedies by other than qualified persons—shall be applied to areas after free institutions for the treatment of these diseases are established

in those areas. Mr. Glyn-Jones moved to omit the words "in any area in which the Act is in operation" in order to submit that the provision should apply throughout the country. He feared that persons who wished for treatment by unqualified practitioners would go from closed districts to open ones, and that this difficulty in working the measure would be quite as glaring in the matter of the sale of drugs.

Mr. Herbert Samuel suggested that the difficulties feared would disappear with time. Mr. Samuel said he regarded this bill with experience at the Home Office and at the Local Government Board. From the latter aspect he viewed it most hopefully, but from the police aspect he foresaw difficulties in securing its enforcement. It would be exceedingly hard to detect individuals who were giving surreptitious advice; that was the fact in cases of grave crimes such as illegal operations, and likely to be still more true in regard to these matters. The only alternative was to get the people accustomed to the use of the free institutions. It was possible that, as had been suggested, Manchester would not join with Salford, but he thought it would. London was joining with all the counties around. He was willing to insert in the second clause of the bill words definitely providing that the bill should not operate in any area until the free institutions had been established there. It was the intention in framing the bill that this should be so.

On a division the amendment was negatived by 21 votes to 8.

The 400 Herbalists.

Mr. Tyson Wilson next proposed that members of the National Association of Medical Herbalists should be allowed to practise—that is, to rank with qualified practitioners. He submitted that they stood in a different position from the ordinary herbalists.

Mr. Hayes Fisher replied that the matter had been carefully considered by the Royal Commission. Under this bill sufferers from these diseases would get the advice of men who were competent to treat them. How was it to be known whether the herbalists were competent? Medical men had had a five years' course of training, of which two or two and a half had been spent in hospital. He was aware that the Royal Commission had referred to the limited experience of many medical men of these diseases, but spoke hopefully of greater study being undertaken. He was present when a deputation of herbalists was received. They argued that the 400 were quite different from the other fellows. It was reckoned that there were 5,000 in the country, but with the other 4,600 they had nothing to do; they did not, however, make much impression. After a little further discussion, the amendment was negatived.

Proposed Special Certificate for Qualified Practitioners.

Another amendment that treatment should be only by qualified practitioners holding a special certificate of competency was also negatived without a division.

Passing on Prescriptions.

Mr. Joseph King raised the possible case of a man who had received treatment from a duly qualified practitioner, and wished to help a friend by passing on the advice. Mr. Hayes Fisher commented that there was nothing more unwise than to lend prescriptions, and Mr. King's amendment to licence such persons was rejected.

The Committee then adjourned until May 3rd, when the consideration of the bill was completed after the clauses had been recast and some changes of definition had been made.

The Criminal Law Amendment Bill.

The Criminal Law Amendment Bill came before the House of Commons on April 30th on report from Grand Committee. The notices of further proposed amendments included a set put down by the Lord Advocate (on behalf of the Home Secretary, who is ill) to modify a new clause added at the last sitting of Grand Committee—to give power to courts to order in certain cases of loitering, solicitation, behaving in a riotous and indecent manner, etc., the detention of girls under 18 years of age. Such detention, it was laid down, should be in approved homes or institutions, the limit of age for detention to be 19 years.

The "Loitering" Clause.

The clause has during the past fortnight been much discussed, the fear being expressed that it carried grave risk to innocent girls who might be wrongly charged with loitering for a purpose. To meet this anxiety the Lord Advocate now proposes that the clause shall apply only to girls who are "common prostitutes." He further proposes that instead of courts of summary jurisdiction being given the power to order to detention, they shall have only (in lieu of passing sentence) the power to commit to quarter sessions, which, before dealing with any such case, would have to consider a report from a probation officer or from a committee, whose duty it would be to inquire as to the "mode of life and associations" of the girls. Provision is made for the appointment of committees, each to include at least two women. It will be seen that numerous securities are offered against the danger that an innocent "flapper" should suffer loss of liberty.

At the outset of report stage in the Commons, however, Mr. Handel Booth moved to recommit the bill. He objected particularly to the detention clause, which, he said, slipped through Grand Committee without proper consideration. The clause struck at the sovereignty of women, and would never have been introduced if women had votes. Commander Wedgwood, seconding the motion, said that the women of the country were furious that such a clause had been introduced. He also pointed to the twenty-five pages of new clauses put down for the report stage as a "crushing reason" why the bill should be recommitted.

The Lord Advocate, replying, held that there had been much misconception about the clause. There was no idea on the part of the Government of making a fresh offence of "loitering." It was not an offence to loiter or importune; it was an offence for any one who was a common prostitute to loiter for the purpose of importuning or soliciting, hence the fresh words to make the matter perfectly clear. Further, to meet the fear of one speaker that a mill hand who kicked up her heels in the streets might be prosecuted for "behaving in a riotous and indecent manner," he said it was intended to omit the words "riotous and" from the definition of offences.

In the course of further discussion, Mr. Dillon said that members had received a communication from the metropolitan probation officers strongly urging that the clause should be amended so that detention in homes should be possible only on second conviction for distinctly sexual offences under the Act.

Ultimately the Lord Advocate accepted a suggestion from Mr. Samuel that this clause should be recommitted to Grand Committee; and Mr. Booth withdrew his motion for the recommittal of the whole bill.

Medical Examination in Prison.

A lengthy discussion afterwards took place on a motion by Sir George Greenwood to add to the bill a clause for the medical examination of persons sentenced for sexual offences, and for their detention at the end of their sentences if they were still suffering from venereal disease; or for their release or licence with directions for their treatment. He maintained that a large proportion of those attacked by venereal disease are innocent women and children. He had had a letter from one of the most experienced metropolitan police magistrates saying that if this clause were passed it would be one of the best in the bill. Captain Guest, seconding, said he would like the clause to go much further, and to give the Home Office power for the examination of all prisoners, whenever there was reason to suspect disease. The Lord Advocate said he was unable to accept the clause, in face of the volume of opinion against it which had been received by the Home Secretary, and in the end the proposal was negatived.

Powers under the Public Health Act.

Mr. Rawlinson proposed another new clause to make it an offence for any person, knowing that he or she was suffering from venereal disease in a communicable form, not to take reasonable precautions against the spread of the disease. Mr. Hayes Fisher (Secretary to the Local Government Board) declined to accept the clause, on the ground that it would be unworkable. It was possible for the Local Government Board to draw up regulations under the Public Health Act of 1875, but he was given to understand that the non-sexual communication of venereal disease was very rare. It was not so uncommon for surgeons or nurses to become infected through attendance on the sick; but it was a very rare thing for any one to get the disease by using any convenience. Regulations might encourage persons with spite to bring proceedings in court. The Government preferred, therefore, to issue circulars of advice.

In the course of further discussion Mr. Burns supported the policy of persuasion. Sir John Simon thought that the clause might be usefully modified, and Sir Wm. Collins said that in Grand Committee he had proposed that it should be the duty of a medical man to make a notification to any person he was treating; in order that the patient should take all necessary precautions; that having been rejected he should not support notification to a third party. Mr. Hayes Fisher, in a further reply, held that under Clause V of the bill against "wilful communication of the disease" there were already powers of considerable strength, but Mr. Rawlinson maintained that the word "wilful" would make conviction very difficult. Mr. Samuel said that after what Mr. Hayes Fisher had told the House as to the powers possessed under the Public Health Act to make regulations if thought desirable, he should vote against the proposed new clause. On a division it was rejected by 107 votes to 20.

Security against the Common Informer.

Mr. Glyn-Jones moved a new clause that proceedings under Clause V (sexual intercourse by a person suffering from venereal disease) or under the Indecent Advertisements Act, 1889, should be taken only at the instance of a local or public authority, unless in England or in Ireland the consent of either the Attorney-General or Solicitor-General had been obtained. In Scotland such a fiat was necessary, and he urged that, as the bill stood, there was in regard to the offence created under Clause V a real danger of blackmailing. The person would fear publicity. Several other members having taken the same view, Mr. Hayes Fisher undertook to consider the matter. He thought that an amendment might be inserted when the bill reached the Lords, to the effect that while a person injured under Clause V might act at once without losing time, and therefore, perhaps, valuable evidence, the fiat of the Attorney-General or Solicitor-General should be required before action could be taken by a third person so that the measure should not give an opportunity to the common informer. Mr. Glyn-Jones thereupon withdrew his amendment.

Additional Penalties.

Mr. Hayes Fisher next agreed to accept a new clause proposed by Mr. Duncan Miller, as to increase of penalty for certain offences where the offender was suffering from venereal disease in a communicable form. The offences were there scheduled to allow of a maximum sentence of two years' hard labour; the clause proposed to permit the sentence to be increased to five years' penal servitude. This was agreed to.

Disorderly Houses.

After a short discussion, Sir Albert Spicer withdrew a new clause which he submitted on behalf of a conference of metropolitan mayors held in London last year. The clause dealt with the occupation of flats and lodgings, and would have provided that persons found in disorderly houses should be treated as persons found in gaming houses when the latter were raided—have their names taken for prosecution. The Lord Advocate said that it was impossible to make the house of a woman who lived by prostitution a brothel in law. However much her conduct might be reprobated it could not be said that she should have no shelter. The other proposal could not be accepted unless Parliament was prepared to make fornication a crime, and no one had been prepared for that course.

Medical Men and Notification.

Captain Guest proposed a new clause, (1) to require a person suffering from venereal disease to place himself (or herself) under medical treatment; and (2) to require a medical adviser, when a patient failed to attend during a prescribed period, to notify the medical officer of health; and (3) to empower the medical officer of health to require such person to submit to treatment. Captain Guest said the words of the clause were copied from an Australian Act, and he repeated arguments frequently given for notification.

Mr. Hayes Fisher, in asking the House to reject the clause, said it would militate against the policy which was promising much success; it would lead to concealment through the risk of publicity. The Local Government Board had given people definite assurance that they could go to free institutions without having their names or addresses known, they could go to towns distant from their homes on the plea of taking a holiday—that policy had already been productive of good results. Sir William Collins in the subsequent discussion said he was well acquainted with the Act of Western Australia which was an example to be avoided. The clause put the medical profession in an unenviable position. If the patient failed to keep up attendance the medical man was to play the part of informer to the central authority. The clause further suggested that the medical man should be the joint instrument with a magistrate in securing a warrant for the patient. The policy of the Local Government Board was the right one. He did not find any request from the medical profession for this co-operation with the magistrate and policeman.

The clause was rejected.

The Age of Consent.

A discussion was begun on a proposal by Mr. Dickinson that the age of consent by a girl should be raised from 16 to 17 years. Under the bill the proviso by which an offender might plead "reasonable cause to believe" that the girl was over 16 was abolished, and in discussion in Grand Committee the Home Secretary had maintained that this gave considerable protection to girls over 16. Mr. Dickinson proposed to raise the age to 17, but retain the proviso in the old form that reasonable belief that the girl was over 17 should be a sufficient defence. In Grand Committee his proposal to raise the age thus was defeated by a majority of one, the Home Secretary resisting it on the ground, amongst others, that it would increase the difficulty of getting convictions. The Lord Advocate renewed this and other objections. Mr. Samuel and Sir John Simon, on the other hand, submitted that the House would be acting below the solid opinion of the country if it did not raise the age, and the debate was adjourned.

The Work of the Civil Liabilities Committee.—Mr. Hayes Fisher, replying to Captain Douglas Hall, said that the conditions under which grants are given through the Civil Liabilities Committee to officers' families were published in Special Army Order of March 14th. The forms of application had been available since March 15th, and a number of grants had already been made. The grants would, in the absence of special circumstances, run from the date of application. (The conditions set out in the Order will be published in our next issue.)

The Treatment of Disabled Soldiers: Advisory Committees.—Mr. Duncan Miller asked the Pensions Minister how many central committees representing the various statutory local subcommittees had been set up in England, Scotland, Ireland, and Wales respectively in connexion with the treatment of disabled soldiers; and how many schemes had been approved by the Ministry of Pensions and by the central committee in each portion of the United Kingdom.

Sir A. Griffith-Boscawen (Parliamentary Secretary to the Pensions Board) said that the committees referred to were joint advisory committees to assist local committees in dealing with treatment and training of disabled soldiers and sailors. Fourteen of these committees were contemplated for England, one or two for Wales, four for Scotland, and three for Ireland. Eight, covering seventeen geographical counties in England, had been agreed to at meetings of local committees' representatives, and the four covering Scotland have been similarly agreed to. A scheme for one or two committees for Wales was under discussion, and some preliminary inquiries had been made in regard to the three proposed for Ireland. He was communicating with various local committees with a view to expediting the formal constitution of the Joint Committees so that they might proceed at once with their work of making available within their large areas the schemes for treatment and training which local committees had framed or were framing.

Pensions and Gratuities for Disabled Soldiers.—In answer to Mr. George Terrell, Sir A. Griffith-Boscawen said that 1,900 applications had been received, mainly in the last two weeks, from men who had been discharged from the army and refused pensions under the regulations hitherto in force. Up to the end of last week 200 pensions and 300 gratuities had been awarded. The remaining cases were in various stages of consideration.

Asked by Mr. George Terrell as to the reconsideration of claims by widows of soldiers and sailors, Sir A. Griffith-Boscawen said that the number of widows' claims rejected for pension or gratuity under the Old Regulations was 1,229, and the number rejected for pension but admitted for gratuity was 475, making a total of 1,704. Of this number 1,013 had up to date been reconsidered, 983 had been admitted to pension, and 30 had been finally rejected. The reconsideration of the remaining cases will be completed in a fortnight.

In reply to Mr. Hogge, Sir A. Griffith-Boscawen said that it was proposed to set up a tribunal to which disabled soldiers who had been awarded a gratuity on account of disablement neither attributable to nor aggravated by military service could appeal if they considered that a pension should be granted to them under the recently enacted Royal Warrant and Order in Council.

The Classification of Army Recruits.—Mr. MacCallum Scott asked the Under Secretary for War on May 1st whether men certified by medical boards as suffering from valvular disease of the heart were passed for service in medical categories B 1 and C 1, and whether there were any instructions dealing with the matter. Mr. Macpherson replied that no instructions had been issued dealing with such cases. The matter depended upon the judgement of the medical examiners. After more interrogations, Mr. Scott said he should on a subsequent evening raise this matter on an adjournment. Mr. Hogge on May 2nd asked whether, in view of the fact that men of B 3 and C 3 categories were not to be placed in higher categories unless their health had improved, he would state what men in those categories who had now been passed for general service should do if they were still suffering from the very same disabilities as placed them in B 3 and C 3. Mr. Macpherson replied that it was not necessarily the existence of a disability but the degree of disability which determined a man's classification. Thus varicose veins, if exceptionally severe, might lead to a man being rejected; if less severe, to his being placed in category C 3 or C 2, and so on. Their mere existence would not debar a man from being placed in category A. They might be quite unimportant. There could be no general rule; each case must be judged on its merits by the medical men before whom it came.

Malaria Patients in England.—In reply to Mr. Cowan, Mr. Macpherson said that centres for the treatment of malaria have been established in each command, and officers with experience of this disease have been placed in charge of them. Malarial cases are now being put through a course of treatment with the hope of eradicating the disease.

Army Medical Board Decisions.—In reply to Mr. Lambert, who asked if a man medically discharged from the army and called up again had the right of appeal from the decision of the army medical authorities, Mr. Macpherson said: A man called up and examined by a recruiting medical board under the Military Service (Review of Exceptions) Act has no right of appeal against his medical classification by the board. Each man, however, to whom the notice requiring him to be medically examined is sent under the Act, has the right of application to a tribunal within thirty days from the sending of the notice, for exemption from military service on any grounds set out in the Military Service Act, 1916, Section 2 (1), including the ground of ill health or infirmity.

Instructions to Medical Boards.—At the instance of Mr. Hogge, Mr. Macpherson has placed in the library of the House of Commons a copy of the fresh instructions issued to medical boards applicable to the men who may be recalled under the Review of Exemptions Act.

THE WAR.

ARTIFICIAL HYPERAEMIA IN GAS GANGRENE.

STABSARZT PROFESSOR A. THIES, writing on the treatment of gas gangrene,[1] stated that the value in particular cases of the method of hyperaemia known as Bier's had not been fully appreciated. In feeble, anaemic subjects, in whom the hyperaemia was often not produced, being replaced by a pale oedema, the method was not applicable; but in cases which displayed a well-marked inflammatory reaction it was often of distinct value. Frequently it arrested the spread of the infection, especially if the process had not advanced to actual necrosis. Operative measures were, of course, required in addition in many cases—where, for instance, abscesses, extensive lacerations, tension, or foreign bodies were present. But the value of the method was best seen where these conditions were absent. For example, in the case of a bullet wound of the calf with small apertures of entry and exit, swelling and redness of the skin, gas in the tissues, and the gas bacillus present in the discharges, hyperaemia was induced during three days, commencing fifty-two hours after wounding. The infection was rapidly arrested, and the patient was transported with the wound in a healthy condition on the seventh day from wounding.

When a foreign body was present it was preferable to remove it forthwith; but this was not always possible, nor necessary. When hyperaemia was employed before removal, the gas-phlegmon often became arrested and a well-localized abscess formed round the foreign body. Similarly with lacerated cavities, hyperaemia often limited the gas-phlegmon, and, the inflammatory area being more clearly defined, less extensive incisions were needed. It also had the effect of accelerating the demarcation of necrotic tissues, here again rendering the placing of incisions much more precise.

The method further enabled much economy to be ensured at times in the matter of amputation. It was customary to amputate through healthy tissues or through merely oedematous tissues, which were presumably free from infection. In such cases a secondary amputation was not infrequently needed on account of spread of infection in the stump. By using hyperaemia it was possible to amputate through the infected tissues and thus save a large part of the diseased limb. In cases in which amputation through the higher parts of the limb had been suggested as necessary, Thies had often amputated through the leg above the limit of actual gangrene, and had controlled the gas infection in the rest of the limb by the hyperaemic method.

Thies draws a distinction between the ordinary gas-phlegmon, which was characterized by the occurrence of brown patches beyond the gangrenous area, and the less common form, probably due to a different micro-organism, in which a dark purple discoloration alone was present, without any trace of yellow or brown. This latter form spread with extreme rapidity and without demarcation, and on section abundant haemorrhagic exudate and venous thrombosis were found in the tissues. Prompt amputation afforded the only hope in these cases, and the method of hyperaemia was valueless.

The method employed was that of intermittent hyperaemia, a compression of about 0.15 of an atmosphere being applied for about sixty seconds and then intermitted for about ninety seconds. A hundred cases of brown gas infection were thus treated, with five deaths, two of which appear to have been due to complications in other parts of the body.

TREATMENT OF TRAUMATIC ANEURYSM.

DR. K. RIEDEL,[2] writing on the treatment of aneurysms, recommended a more frequent recourse to conservative measures. The present tendency was to operate as early as possible in all forms of aneurysm, suture being the method of choice, though, owing to the frequency of infection, ligature was the operation commonly employed. Since untoward results, such as gangrene and paralysis, at times followed this operation and could never be with certainty excluded, it was justifiable to test the value of conservative methods, and accordingly at Riedel's station all aneurysms that did not require immediate operation were at first treated by compression. Continuous firm pressure was applied to the tumour by means of a rubber sponge held in place by a bandage. The pressure was subsequently increased by means of a sandbag. In addition, digital compression was applied to the artery above the wound for a quarter of an hour, gradually increased to one hour, every day. The treatment was carried out in twelve cases, a cure being effected in five (carotid, subclavian, two femoral, popliteal).

The most favourable cases for compression were those of arterial aneurysm. In arterio-venous aneurysm the conditions were less satisfactory, theoretically a cure being possible only by complete obliteration of the sac. The communication between artery and vein could, however, but rarely be effected by compression, and an arterio-venous fistula usually persisted, as occurred in one of the author's cases. This, however, did not necessarily lead to serious circulatory derangement. Aneurysmal varix was the least favourable form for compression.

The main disadvantage of the method was that operation was ultimately necessary in a considerable proportion of cases. But even here the treatment was not without its use, since it favoured the development of the collateral circulation, which was of advantage in the subsequent operation. A further objection to the method was the danger of rupture of the sac and the occurrence of acute haemorrhage. This complication could, however, hardly arise without warning, provided careful clinical observation were carried out; an encapsuled aneurysm did not suddenly collapse; rupture was always preceded by premonitory signs.

The method had its limits and was unsuitable for recent wounds of the vessels, with acute symptoms. Such were all forms of arterial haemorrhage where palliative measures were clearly out of the question, and all aneurysms which showed signs of infection or threatened rupture. Operative treatment was also indicated, where, from pain or motor or sensory paralyses, it appeared that nerves were compressed by the aneurysm; such cases were not suitable for compression.

WAR SURGERY IN THE CARPATHIANS.

IN the *Medical Record* of March 31st Dr. B. F. Morowitz of New York, formerly military surgeon with the Austro-Hungarian and Bulgarian armies, gives an account of cases that came under his care from July 11th to November 28th, 1915, in the quarantine hospital at Munkacs at the foot of the Carpathians.

Owing to the severity of the shell fire the wounded often could not be brought in till after many hours. When possible, however, they were carried to a place of comparative safety, where they were quickly dressed with an antiseptic dressing by the Red Cross men or "Sanitäters," and afterwards taken to the first dressing station or 'Verband-platz." These stations were generally situated in the second or third line of trenches, and there the men were properly dressed by surgeons and at once transferred to the field hospital just behind the line of big guns. After the application of splints and the performance of emergency operations, patients in "fairly" good condition were placed in the Red Cross trains and carried to the quarantine station for observation and further treatment; subsequently they were removed to the base hospital in the interior. The whole process took from one to two weeks provided that at the quarantine station the patient was found to show no rise of temperature and to be free from typhus, cholera, dysentery, small-pox, or other infection.

As far as Hungary is concerned Morowitz says the two stable institutions are the quarantine station at the border and the base hospital in the interior. The dressing stations, field hospitals, and hospital trains may be anywhere between the fighting line and the quarantine station. After the great offensive of the Central Powers in May, 1915, the front was gradually being pushed further and further from the Munkacs military quarantine station, so that the severity of the wound cases admitted was progressively less as the badly injured men were either almost cured or had died in the long transport.

[1] Bruns's *Kriegschir.*, Heft 34, p. 595.
[2] *Deut. med. Woch.*, 1917, No. 8, p. 230.

Of 2,160 cases which came under the personal care of Morowitz 1,306 were wounds caused by bullets, modern projectiles of all kinds and the bayonet, the remainder being diseases of one kind or another, including venereal. Among the 1,306 surgical cases there were 64 deaths; 155 operations were performed with 17 deaths. In cases not operated upon, the wounds were dressed with sterile gauze, sometimes with a little tincture of iodine painted over the surface. Most of them were more or less infected, and Morowitz attributes his success to his not using the probe. To the surgeon of to-day the use of the probe is entirely unnecessary as he can now avail himself of the *x* rays. The modern highly explosive projectile may lodge in some situation which can be determined only by radioscopy. Of the cases operated on, twelve were fractures of the skull caused by shrapnel; in these Morowitz trephined after a study of the *x*-ray plates and extracted the projectiles. In one of them an abscess formed which required incision into the dura and drainage; the man eventually died. Six were injuries to the face; in three of these simple plastic operations were performed. Fifteen operations on the thorax included ten bullet extractions and opening of abscesses and five rib resections; of the latter cases, one was a purulent pleurisy, two haemopyothorax, and two pyopneumothorax. Four of these thorax cases died. Morowitz is still of opinion that it is best to leave all abdominal cases alone as much as possible. The patients should be kept absolutely at rest, with light fluid diet, and the occasional administration of morphine for pain. Irrigation with warm saline solution and dressings of sterile gauze were carried out daily. The mortality in Morowitz's cases is not definitely stated, but he says it was "high."

Injury of the upper limb was very frequent, probably because that part is mostly exposed to fire, especially in trench warfare. Of the twenty-seven operations on the arm three were extractions of bullets, sixteen sequestrotomies, curettages, and applications of plaster-of-Paris dressings for fracture; two were amputations for gangrene, four simple incisions for abscess or pus infections, one was ligation of the brachial artery, and one a case of gas bacillus infection in which multiple incisions were made; another case was a fracture of the clavicle by a rifle bullet. Morowitz says that in all cases of fracture of the humerus fixation of the shoulder, elbow, or wrist-joints is necessary. The arm should be placed in pronation with the elbow flexed at right angles; a triangular splint should be placed under the axilla, one side reaching down to the elbow-joint, one apex being in the axilla and one just below the wrist; the lower angle is brought a little forward. A plaster-of-Paris splint may be applied instead on the whole extensor surface of the extremity reaching from the neck to the finger tips, the elbow being flexed at right angles, and the whole supported by a sling hanging from the neck. Of forty-four cases operated on for injury to the elbow-joint, forearm, and hand, three were simple bullet extractions, twenty-three fractures, two amputations for gangrene, two incisions for deep infiltrating pus infections, one a gas bacillus infection, and one haemorrhage from the radial artery. For fracture of the elbow-joint Morowitz used fixation at right angles of the arm and forearm with plaster-of-Paris arranged so that the wound was entirely exposed, the two parts of the bandage being bridged by three arc-shaped iron bands in as many directions over the seat of injury. There were twenty-eight cases of operations on the hip and thigh, eight incisions for abscesses and extraction of projectiles, fourteen fractures by shell and bullet, one fracture of the innominate bone, and five amputations for extensive gangrene from all causes.

Fracture of the femur was treated by elevated extension of the whole limb. All loose pieces of bone were removed and necrotic splinters clipped off. Thorough drainage, daily irrigation with potassium permanganate solution and dressings of sterile gauze, performed with the patient lying in the extension apparatus, constituted the procedure employed at the quarantine hospital. Infections of the knee-joint involving the synovial membranes were, Morowitz says, among the most serious conditions met with, the chief danger being septicaemia. The mortality in such cases at his hospital was high. This was due to the fact that septicaemia was allowed to develop too far before amputation was done. He thinks the surgeon cannot be too radical in these cases. Of the twenty-six cases of operation on the knee-joint, leg and foot, fifteen were incisions for abscesses, pus infections and extraction of projectiles; nine were for fractures, the usual surgical procedure being employed, and two were amputations for severe gas bacillus infections. In addition to these statistics, Morowitz has collected the histories of 106 cases of tetanus. One was a case in which the condition came on after a wound of the abdomen, two after wound of the arm, fourteen of the forearm, twenty-one of the hand, fourteen of the thigh, twenty-six of the leg, and twenty-seven of the foot.

MEDICAL SERVICES IN MESOPOTAMIA.

A VERY reassuring account of the present arrangements for dealing with the sick and wounded of the Mesopotamia campaign is given in a letter addressed to the Secretary of State for India, by Sir Arthur Lawley, who went out at the end of last year as the chief Commissioner in Mesopotamia of the British Red Cross Society and Order of St. John. At that time, as he truly states, there was much misgiving and uneasiness in the minds of many people at home as to the adequacy of the provision made for the welfare of the troops on that front, and for the care of the sick and wounded.

Sir Arthur Lawley on landing at Bombay went to Delhi, where he discussed the present situation with the Viceroy, the Commander-in-Chief, Surgeon-General Sir Pardey Lukis, and Surgeon-General O'Donnell. He then visited Bombay, where he inspected the work of the hospitals, of the Red Cross, and of the organization for supplying comforts to the troops, and found everything highly satisfactory. Sailing from Bombay to Basrah in the hospital ship *Madras*, he familiarized himself with the arrangements for the reception of the sick and wounded, and for their care in transit. He watched the loading up of the hospital ship, and found nothing left undone that could add to the comfort and wellbeing of the patients when on board. At Basrah he visited the camps, hospitals, and convalescent homes. On all sides he heard praise of the Red Cross river launches. With regard to those black days when the Mesopotamia campaign was a series of disasters and breakdowns, he says that the "darkness is only relieved by the splendid patience and long-suffering of our sick and wounded, and the heroism and self-devotion of the doctors, the nurses, and the staffs of the river boats." To-day order has been evolved out of chaos. Communications of every kind, facilities for unloading and loading vessels, and abundant stores are all available. The medical equipment is lavish, the water supply and sanitation have been taken in hand, and great efforts are being made to subdue the fly plague. Of the new "P" boats we learn that these are adequately staffed and equipped, and that doctors and nursing sisters, medical orderlies and ward boys are in sufficient numbers for any emergency. At Shaikh Saad there are now two large hospitals and a casualty clearing station, and during his visit Sir Arthur Lawley saw the elaborate arrangements at work for evacuating the wounded. During a bombardment he visited the collecting stations in the trenches, the advanced dressing stations, and the field ambulances, thus seeing with his own eyes the *via dolorosa* of the wounded man. He cannot find words of praise too high for the efficiency of the medical machine in Mesopotamia.

Sir Arthur Lawley has himself played a prominent part in the Red Cross work in France, and his tribute to the medical services on the arduous Tigris front will bring encouragement and consolation.

HONOURS.

A SPECIAL supplement to the *London Gazette* issued on April 26th contains a list of honours and decorations conferred for gallantry and devotion in the field.

To be Companion Distinguished Service Order.

The following are the particulars of the deed for which Captain Allan Watson, M.B., R.A.M.C., has been awarded the D.S.O., as announced in the *London Gazette* of March 17th (BRITISH MEDICAL JOURNAL, March 24th, p. 405):

For conspicuous gallantry and devotion to duty. He went forward under very heavy fire, before his own unit was ordered to advance, and commenced to dress the wounded of another battalion. He worked untiringly under fire both day and night, never resting until all the wounded had been brought in.

Military Cross.

Captain John Hardie, A.A.M.C., receives the decoration of the Military Cross.

For conspicuous gallantry and devotion to duty. He attended a large number of wounded at the aid post under heavy fire, and continued to work after being wounded himself in two places. He set a fine example throughout.

Temporary Lieutenant Erach Ruttonji Daboo, I.M.S., also receives the Military Cross for distinguished service in the field in Mesopotamia.

The Military Medal has been conferred upon twenty non-commissioned officers and men of the R.A.M.C., seven of the Australian A.M.C., and two of the New Zealand M.C.; nine non-commissioned officers and men of the R.A.M.C. also receive the Meritorious Service Medal for valuable services rendered with the armies in the field.

A supplement to the *London Gazette* of May 1st contains a list of decorations awarded by the Allied Powers for distinguished services rendered during the course of the campaign. The list of honours conferred by the President of the French Republic include the following officers of the R.A.M.C. and colonial medical corps:

LÉGION D'HONNEUR.

Croix d'Officier.: Colonel H. D. Rowan, M.B., A.M.S.

Croix de Chevalier: Lieutenant-Colonel A. Mignault, C.A.M.C., Captain V. B. Green-Armytage, M.D., M.R.C.P., I.M.S., Quartermaster and honorary Major H. W. Blaylock, C.A.M.C., Quartermaster and honorary Captain E. J. Buckley, R.A.M.C.

Croix de Guerre.—Major H. H. Woollard, A.A.M.C.; Captain A. C. Armstrong, C.A.M.C.; Temporary Captain (temporary Major) A. G. Whitehorne-Cole, R.A.M.C.; Temporary Captains K. G. Fraser, R.A.M.C., W. A. L. H. Henderson, M.B., R.A.M.C., H. L. G. Hughes, D.S.O., R.A.M.C., B. B. Noble, M.B., R.A.M.C., and R. R. Scott, M.B., R.A.M.C.; Temporary Lieutenant St. J. D. Buxton, R.A.M.C.; Quartermaster (acting Sergeant-Major) W. Stokes, R.A.M.C.

A number of non-commissioned officers and men of the medical services have also received the decorations of the Croix de Guerre and the Medaille Militaire.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

LIEUTENANT-COLONEL D. B. CHILES-EVANS, D.S.O., R.A.M.C.(T.F.).

Lieutenant-Colonel David Brynmor Chiles-Evans, D.S.O., R.A.M.C.(T.F.), was killed in action on April 23rd, aged 39. He was educated at University College, Cardiff, and at University College, London, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1903. After acting as house-surgeon of Bridgwater Infirmary, he went into practice at Landore, Swansea, where he was assistant medical officer of the Swansea Union. He attained the rank of captain in the R.A.M.C.(T.F.), in the 3rd Welsh Field Ambulance, on December 12th, 1908, went out in the original Expeditionary Force as captain in No. 18 Field Ambulance, R.A.M.C., Special Reserve, to which he was appointed on August 5th, 1914, and had since been promoted to major and to lieutenant-colonel. He received the D.S.O. on June 3rd, 1916.

CAPTAIN L. B. BAIRD, R.A.M.C.

Captain Leonard Barron Baird, R.A.M.C., was killed on April 21st, aged 29. He was the elder son of Dr. Baird, of Bury, and was educated at Manchester Grammar School, and at the Victoria University, Manchester, taking the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1914. He joined the 5th (Territorial) Battalion of the Manchester Regiment as lieutenant and medical officer on September 5th, 1914, and was promoted to captain after a year's service. He had previously served in Gallipoli.

CAPTAIN J. E. BLACK, M.C., R.A.M.C.

Captain James Elliot Black, M.C., R.A.M.C., was killed on April 19th. He was the only son of the late Adam Elliot Black, chartered accountant, Glasgow, and was educated at Glasgow University, where he graduated M.B. and Ch.B. in 1911, afterwards going into practice at Westbourne Terrace, Glasgow. He joined the Special Reserve of the R.A.M.C. as lieutenant on September 28th, 1914, and was promoted to captain after a year's service. He received the Military Cross on November 14th, 1916.

CAPTAIN G. D. FERGUSON, D.S.O., R.A.M.C.

Captain George Douglas Ferguson, D.S.O., R.A.M.C., was killed in action on April 22nd, aged 27. He was the second son of Mr. John Ferguson, of Edinburgh, and was educated at Edinburgh Academy and at the University in that city, where he graduated M.B. and Ch.B. in 1913. He took a temporary commission as lieutenant in the R.A.M.C. on August 14th, 1914, and was promoted to captain after a year's service. He received the D.S.O. on November 14th, 1916.

CAPTAIN E. HARRISON, R.A.M.C.(T.F.).

Captain Everard Harrison, R.A.M.C.(T.F.), was killed recently, aged 37, by the blowing up by a mine of premises recently vacated by the enemy, which were being used by the British as an advanced dressing station. He was the son of the late Mr. Stockdale Harrison, and was educated at Wyggeston Grammar School, at St. Bartholomew's Hospital, and at Cambridge, where he graduated B.A. in 1900, B.C. in 1904, and M.B. in 1905. After acting as house-physician of the Hospital for Women, Soho, and as senior house-surgeon of Scarborough Hospital, he went into practice at Leicester, where he was surgeon to St. Mary's Refuge. He had recently taken a commission as captain in the R.A.M.C.(T.F.), on the staff of the 5th Northern General Hospital, and was attached to the Gloucestershire Regiment when killed.

CAPTAIN G. R. PLAISTER, R.A.M.C.

In our last issue we printed a short obituary notice of Captain Geoffrey R. Plaister, R.A.M.C., who was killed in action on April 11th. A colleague writes: By the death of Geoffrey Plaister the medical profession of Tottenham sustains an irreparable loss. His gallant death in an attempt to relieve suffering was in keeping with his life. Unsatisfied with the routine of a busy practice, he devoted much of his hard-earned leisure to hospital duties. His mental energy and untiring devotion to his profession kept him abreast of every measure that had for its purpose the advancement of medical science and its application to the healing of disease. Our heartfelt sympathy goes out to his bereaved father, brother, and sister.

Died of Wounds.

LIEUTENANT J. A. S. BURGES, R.A.M.C.

Lieutenant James Alexander Stuart Burges, R.A.M.C., died of wounds on April 23rd. He was educated at Glasgow University, where he graduated M.B., Ch.B. in 1910. After filling the posts of house-surgeon at the Glasgow Western Infirmary and at the Glasgow Maternity and Women's Hospital, and of assistant physician to the Orphan Homes of Scotland and Consumption Sanatorium at Bridge of Weir, he went into practice at Carronshore, Stirling County, where he was medical officer of the parish of Airth. He had only recently taken a temporary commission as lieutenant in the R.A.M.C.

LIEUTENANT J. A. GREGORY, R.A.M.C.

Lieutenant James Alfred Gregory, R.A.M.C., was reported as having died of wounds in the casualty list published on April 25th. He was the only son of Roger Gregory, of Standish, near Wigan, and was educated at Manchester Grammar School and at the Victoria University, Manchester, taking the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1914. He had only recently taken a temporary commission as lieutenant in the R.A.M.C.

Died on Service.

COLONEL J. H. E. AUSTIN, A.M.S.

Colonel John Henry Edward Austin, A.M.S., died at a military hospital in London on April 21st. He was born on May 25th, 1863, the son of the late Rev. Edward Austin, of Hendlesham, Suffolk, and was educated at St. George's Hospital, taking the diplomas of L.R.C.P.Edin. in 1887 and the M.R.C.S. in 1892. He entered the R.A.M.C. as surgeon in 1891, becoming major on November 29th, 1900, and lieutenant-colonel on May 4th, 1912, being promoted to full colonel on March 1st, 1915. He served in the Nile campaign in 1898, receiving the medal and the Khedive's bronze star, and in the South African war from 1900 to 1902, receiving the King's and Queen's medals with five clasps.

Lost at Sea.

LIEUTENANT I. R. R. BROGDEN, R.A.M.C.

Lieutenant Ingram Richard Rhodes Brogden, R.A.M.C., is reported as "missing, believed drowned." Presumably he is the medical officer reported as missing when the hospital ship *Lanfranc* was torpedoed and sunk in the Channel. He was the only son of Dr. R. W. Brogden, of Ipswich, was educated at Cambridge and at Guy's

Hospital, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1916. He accepted a commission in the R.A.M.C., but was granted six months' leave to act as house surgeon at Guy's Hospital. At the expiration of this period he joined up at Blackpool and was ordered to Egypt.

Staff Nurse E. S. Gurney, Q.A.I.M.N.S. Reserve, is also reported as missing, believed drowned.

Wounded.

Major O. L. Appleton, R.A.M.C.(T.F.).
Captain A. Budd, R.A.M.C. (temporary).
Captain J. W. Burton, R.A.M.C.(T.F.).
Captain J. P. S. Cathcart, Canadian A.M.C.
Captain H. J. Cotte, R.A.M.C.(temporary).
Captain G. J. Linklater, R.A.M.C.(T.F.).
Captain N. Macleod, R.A.M.C. (temporary).
Captain A. G. Troup, R.A.M.C.(temporary).
Captain J. Walker, R.A.M.C.
Captain R. H. Wilson, R.A.M.C.(temporary).

DEATHS AMONG SONS OF MEDICAL MEN.

Barrett, Keith J., Captain Royal Fusiliers, elder son of Lieutenant-Colonel J. W. Barrett, C.M.G., R.A.M.C., of Collins Street, Melbourne, died of wounds on April 16th, aged 25. He was educated at the Church of England Grammar School, Melbourne, and at Melbourne University, where he was studying agricultural science, and represented the university in the heavy weight boxing championship. Enlisting in the Australian forces at the beginning of the war he got his commission while in Egypt in 1915, and joined his regiment at Suvla Bay. He was invalided thence to England, and, rejoining, was wounded last July, but joined his regiment again in September; he had been mentioned in dispatches.

Chepmell, William Dobree, Lieutenant Royal Sussex Regiment, son of Dr. Charles Chepmell, killed recently, aged 21. He got his first commission on September 22nd, 1914.

Erskine, William Robert, Canadian Forces, only son of the late William Erskine, M.D., of Sydenham, killed between April 8th and 12th, aged 32.

Goodman, E. G., Second Lieutenant Dorsetshire Regiment, son of Dr. T. H. Goodman of Havarhill, Suffolk, killed April 12th. He was in the Civil Service before the war, enlisted early in the war in the 15th Battalion of the London Regiment, Prince of Wales Own Civil Service Rifles, and got his commission in 1916.

Hallwright, W. W., Lieutenant Commander R.N., youngest son of Dr. Matthew Hallwright of Edgbaston, killed April 21st, aged 33.

Macpherson, Robert Nasmyth, Major Indian Army, youngest son of the late Brigade-Surgeon-Lieutenant-Colonel R. N. Macpherson, R.A.M.C., killed April 18th, aged 37. He was born on September 20th, 1879, joined the Duke of Cornwall's Light Infantry as second lieutenant on August 3rd, 1898, was transferred to the Indian army on August 27th, 1900, and became captain on August 3rd, 1907, and major on August 3rd, 1916. When the war began he was at home on leave and was posted to the Argyll and Sutherland Highlanders, with whom he served in France, being wounded at Loos. Subsequently he rejoined his own regiment. He had served in the 40th Pathans since 1902, and took part in the Tibet war in 1903-4, including the march to Lhasa, and received the medal. He held an interpretership in Russian.

Roxburgh, John Wood, Lieutenant Royal Scots Fusiliers, son of Dr. William Roxburgh, of Troon, killed on April 19th, aged 20. He got his commission on August 14th, 1914.

MEDICAL STUDENTS.

Anderson, William, Second Lieutenant Black Watch, eldest son of ex-Bailie Robert Anderson, of Burnbank, died of wounds recently, aged 26. Before the war he was a second year medical student at Glasgow University, where he was in the O.T.C. He got a commission in 1915, and had twice previously been wounded.

Carmichael, Andrew W., Second Lieutenant, killed recently, was a medical student at Edinburgh University before he joined the army.

Rose, William, Lieutenant Highland Light Infantry, killed April 11th, was educated at George Watson's College, Edinburgh, and at the University in that city, where he was a medical student when the war began. He then enlisted in the 4th Battalion of the Royal Scots, and got a commission on February 26th, 1915. He was wounded last year, and returned to the front in January.

Thomson, Alexander Anderson, Private, Gordon Highlanders, son of Mr. Thomson, of Aberdeen, killed April 9th, aged 21. He received his early education at the Aberdeen Grammar School, and was a third year medical student at the University of Edinburgh before he enlisted.

NOTES.

CURATIVE WORKSHOPS IN GERMANY.

FROM an article published recently by Professor Blind[1] of Strassburg, it appears that some German authorities are beginning to see the necessity, following the example of Belgium, France, and Great Britain, of taking steps to arouse the mental as well as the physical powers of soldiers by the establishment of curative workshops. In his own hospital he has added to the medico-mechanical department a workshop, so that surgical and orthopaedic treatment may be combined with work for the body and mind. He had set his face against the output of gimcracks, such as glasses plastered over with cigar wrappers and ash trays of gilded glass; the task he first set men with crippled fingers was basket plaiting, but, as he foresaw that an army of crippled basket makers would find an insufficient market for their wares after the war, he gave them other tasks as they became more nimble, with the result that his patients provided their own splints, artificial limbs, and even metal operating tables.

Scotland.

A CONFERENCE between the Pensions Minister, the Rev. Dr. Burns, and Sir C. Arthur Pearson, on April 26th, arrived at an amicable arrangement regarding the future working of Newington House, Edinburgh, for the care of Scottish blinded soldiers and sailors. Their care will be in the hands of Newington House, in a hostel which will receive the benefits of the large funds placed at the disposal of St. Dunstan's Institution in London. Probably the committee in Edinburgh will be enlarged by the introduction of representatives from different parts of Scotland.

THE FOOD PROBLEM.

Professor W. Russell, president of the Royal College of Physicians of Edinburgh, gave, on April 26th, the first of four lectures on the food problem. The Principal of the University was in the chair, and there was a large audience, consisting chiefly of ladies. Professor Russell said that there were four causes for the shortage of food: the first was that the supply of wheat was small because of the poor harvests; the second was the difficulty of transport; the third, increased consumption; and the fourth, submarine destruction of vessels and their cargoes. Judging from public statements made there was a possibility of definite famine in this country. He believed Prussian military autocracy would fight so long as it could command the men, would let its people starve, and shoot them down with as much indifference as it torpedoed hospital ships with its own wounded on board. Professor Russell then discussed the general principles of dietetics, pointing out incidentally that the amount of starch in potatoes was only 18 per cent. against 80 per cent. in tapioca, sago, and arrowroot.

THE EDINBURGH CHILDREN'S HOSPITAL.

The Lord Provost, in presiding at the annual meeting of the Royal Edinburgh Hospital for Sick Children, said that in regard to the east of Scotland it filled the place the Royal Infirmary held in regard to adults. The number of in-patients treated during 1916 was 2,250, larger than in any previous year and larger by 150 than in 1915. The number of out-patients had increased from 25,053 to 26,842. The cots in the convalescent home at Muirfield had also been fully occupied, 193 children having been sent there, as compared with 175 in 1915. The staff had been much depleted by the call of the war, but the work had been carried on with energy and efficiency by Drs. A. S. Cumming, R. Thin, and Mowbray Pearson, and Mr. A. P. Mitchell, who had been in full charge of the surgical work.

LUNACY IN 1915.

The second annual report of the General Board of Control for Scotland (for 1915) appeared unusually late and in a much attenuated form, owing to war exigencies. Its 37 pages comprise general statistics of the insane and mentally defective in Scotland, concise notes of the condition of establishments provided for them, and references also to the recognized accommodation for them in private dwellings. Like the corresponding figures for England and Wales (see BRITISH MEDICAL JOURNAL, March 24th, 1917, p. 406), the Scottish statistics for 1915

[1] *Med. Klin.*, No. 21, 1916.

show a falling off in the number of registered insane (of both sexes and all classes) as compared with 1914, and it is remarked that this is the first occasion since the Scottish Commission was instituted in 1857 that a decrease has been noted. On January 1st, 1916, there were in Scotland, under official cognizance, 19,108 insane persons as compared with 19,557 on January 1st, 1915, showing a decrease of 449. It is pointed out that part of this decrease is due to the fact that during the year 317 inmates of institutions for mental defectives, formerly registered under the Lunacy Acts, had been transferred to the special list under the Mental Deficiency Act, and that there were three fewer lunatics in Perth Prison. "There remains, however," the Commissioners state, "an actual decrease of 129 patients which cannot be accounted for in this way;" it would appear, however, that a diminished admission-rate and a higher death-rate are contributory factors to the result. War economy has precluded expenditure upon new buildings for the care of mental defectives, and the operation of the new Act has been largely in abeyance. On January 1st, 1916, 1,203 of this class were on the Board's Register, 305 in certified institutions for adults, 587 in certified institutions for juveniles, and 311 in private dwellings, all but 27 being "aided" from public funds.

Ireland.

THE Rathdown Board of Guardians has decided to send to each board of guardians in Ireland a resolution expressing the desire that a bonesetter should be appointed for each rural district in Ireland. At the meeting at which this resolution was adopted, the board had before it a letter from the Local Government Board transmitting the report of its inspector, made as a result of an inquiry with reference to the death of a patient in the Union Hospital. The evidence, it was stated, showed that great lack of supervision, amounting to negligence, had existed in the hospital.

DUBLIN HOSPITAL FOR ABROAD.

In pursuance of its policy of meeting the submarine campaign against hospital ships by establishing a larger number of hospitals abroad, the War Office has arranged for a hospital to be officered from Dublin. The arrangements made by the medical profession in Dublin to staff a hospital for France have now been completed and approved. Some difficulty was encountered because a condition eventually made by the War Office was that the members of the staff should be between 40 and 55 years of age; this has now been surmounted, and the first staff is in readiness to proceed. It has been arranged that its members shall work in relays, to be relieved every three months, according to a principle which is understood to apply to similar hospitals staffed from London.

AN ELECTION SCENE.

The *Belfast Daily Telegraph* of April 23rd contains a report of a stormy meeting of the Omagh Board of Guardians. We learn from it that the boardroom was very congested, and that on several occasions turmoil prevailed between the Sinn Feiners, Hibernians, and United Irish Leaguers. The trouble was about the appointment of dispensary doctors, and at times the shindy must have been tremendous. The liveliness began with the reading of a letter from the Local Government Board of Ireland declining to sanction the appointment of Dr. Patrick Clarke as a locumtenent, because he was eligible for service in the R.A.M.C. On a show of hands, a defiant motion to continue the appointment of Dr. Clarke was carried. Four applications were then considered for the position of medical officer of the Omagh No. 1 Dispensary District, and the proceedings rapidly warmed up. One of the candidates, Dr. M'Cartan, has been deported to England; another, Dr. Duncan, has retired from the Royal Army Medical Corps owing to an injury to the eye. The final vote was for Dr. M'Cartan 48, for Dr. Duncan 27, and the former was declared elected. Before the vote was taken we read of cheers and counter-cheers, frantic waving of arms, loud groans, and the interchange of polite epithets, which call to mind the Eatanswill election. It would seem that the supporters of the victorious candidate, knowing their voting strength, discouraged anything in the nature of argument on the other side, one speaker's remarks being inaudible in the din of hisses, boohs, and roars. Judging from the report, it does not appear that the meeting gave any consideration to the relative medical capacities of the candidates, the vote being on party lines.

England and Wales.

CENTRAL MIDWIVES BOARD.

AT the monthly meeting of the Central Midwives Board, on April 19th, Sir Francis Champneys was re-elected chairman, and the Board resolved to inform the National Council for Combating Venereal Diseases that, in view of the grave national dangers arising out of the neglect or improper treatment of these diseases, legislation to render it a penal offence for any person other than a qualified medical practitioner to undertake the treatment should be immediately introduced. The Board, in reply to a communication from the Medical Committee of the Birmingham Maternity Hospital, stated that it was unable to accept the suggestion that two lecturers should be authorized to deliver the course of lectures and to sign the necessary certificates in respect thereof. At a penal session on the following day seven women were struck off the roll, the most serious charges including neglect, with fatal results, in cases of concealed haemorrhage and puerperal fever.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

The annual meeting of the Governors and Council of King Edward's Hospital Fund for London was held on April 27th at St. James's Palace, when the accounts and reports for 1916 were received. The treasurer, in presenting the financial statement, pointed out that, notwithstanding the heavy calls entailed by the present state of affairs, the Fund had received such continued support as to enable it to make a substantial addition to the reserve. The total receipts for the year were £326,474, and the amount distributed £170,000, being £30,000 more than the amount applied to this purpose in 1915. The large addition to the grants did not by any means exceed the needs of the hospitals, upon whom the war has cast increasing burdens. In order to maintain the annual distribution of £170,000, about £80,000 has to be raised each year from subscriptions, donations, and legacies. It is satisfactory to note that the former two items show an increase of £154 over 1915, while the contribution from the League of Mercy—£15,000—was the largest for the past four years.

THE TREATMENT OF VENEREAL DISEASE IN BOOTLE.

The public health authority of Bootle has made arrangements for the free treatment of venereal diseases under the regulations of the Local Government Board. A clinic will be established at the Bootle Borough Hospital, at which the medical officer appointed for the work will attend two days each week. No evening clinic will be arranged for, but arrangements will be made for the convenience of patients whose work prevents attendance at the ordinary hours. Two beds will be reserved at the hospital for such patients as may require indoor treatment. Arrangements for diagnosis have been made both with the hospital at which the clinic is established and with the University of Liverpool. Routine examinations of smears will be made at the clinic, but the more complicated blood tests at the university. Private practitioners will be given the option of taking the morbid specimens themselves, of sending their patients to the centre for the collection of the material, or of sending their patients to the university laboratory. The scheme does not include provision for consultation on or treatment of patients in places other than the hospital. Consultation with the medical adviser of any patient will be welcomed at the hospital, but if the medical officer is called upon to attend patients in their homes a special fee will be charged by him; the fee to be arranged with the patient or his friends. On personal request from private practitioners, reports on the previous treatment of patients will be furnished, but such reports will be given only with the consent of the patients. No estimate is given for the

cost of diagnosis. But it is estimated that the cost of the clinic for the first twelve months will be £400. The pay of the medical officer in charge of the clinic is put down as £100 per annum. This is not the rate of remuneration laid down by the British Medical Association—indeed, it is barely that which is the current honorarium for "clinical assistants" who work under the direction of a medical officer in charge.

Correspondence.

THE CALLING UP NOTICE.

SIR,—The ill-considered—or, more accurately speaking, unconsidered—instructions issued by the Director of Recruiting must have caused much annoyance to the medical profession. The extraordinary infelicity of the "Blackpool" allusion should become a classic of unfortunate phraseology.

There is, however, another aspect of the matter to which, basing a few remarks on the experience of an area of not inconsiderable size though sparsely supplied by doctors, which has already answered every call made upon it by the Central Medical War Committee, I should like to draw attention.

The Kesteven Local Medical War Committee met on April 26th to consider the very grave problem suddenly thrust upon it. All the members, seven in number, were present, and invitations were given to ten medical men of military age to attend. Nine of these came, the solitary exception being a doctor who was prepared to sign the form of contract to rejoin (in his case) the R.A.M.C.

Of the sixteen men, three lived in the locality, and the other thirteen had to travel distances which amounted in the aggregate to 403 miles to attend the meeting and return home, an average of thirty-one miles for each, and this at a time when railway fares are raised, when there is a shortage of petrol, and, more important still, when each of the men, without exception, was, in addition to his own work, helping to carry on the practice of a colleague absent on service. At the meeting the old ground was gone over again, as on previous occasions, and no important information could be supplied to the Central Medical War Committee.

On the following day, April 27th, we were able to read in the morning's paper that the War Office had receded from its impossible position, and that the meeting, with its waste of time and money, was therefore unnecessary. Consider that meetings like this took place all over the kingdom and calculate the wasted time and pecuniary loss of a profession already overworked.—I am, etc.,

CHARLES H. D. ROBBS,
Honorary Secretary, Kesteven Local Medical War Committee.

Grantham, April 29th.

DEATH FROM HIGH EXPLOSIVES WITHOUT WOUNDS.

SIR,—The following sentences are taken from a recent issue of a daily newspaper: "The extraordinary thing was that none of these huddled bodies showed any signs of a wound. The monstrous concussion of a great shell exploding outside that confined space had apparently killed the whole of them instantaneously. One corpse had a telephone receiver in its hand."

In 1915 I described in your pages some strange wounds caused by the explosion of nitro-glycerine carelessly handled by one of three workmen who were sitting together in a cabin; and I ventured to suggest that the production of a sudden vacuum, and the consequent release of the internal pressure from the bodies had caused the strange and extensive wounds, and that the impact of any small portions of the old salmon tin in which the nitro-glycerine exploded provided the situation of the escape of pressure through the strange funnel-shaped wounds with, in most cases, no tear or other injury to the overlying garments.

After the battle of the Somme last year one of the American journalists described the finding of several uninjured bodies in a steel and concrete redoubt which had been subjected, but without destruction, to heavy firing from some of our largest guns, and attributed the deaths without wounds to the concussion, giving his readers to understand, as in the instance quoted at the beginning of this letter, that the stroke of death had come forth without.

A little consideration must compel anyone to conclude that this was impossible, and that the true cause was the sudden snatching away of the atmospheric pressure in and around the bodies by the voracious vacuum suddenly produced outside.

A surgeon newly returned, nerve-shattered, from the Somme attack, described to me the awful sensations which accompanied a similar happening. He and his men were sleeping in one of the large underground caverns laboriously excavated by the Germans. His bed was near the mouth of the outlet ventilating shaft, 30 ft. long, the inlet being a long flight of steps. Being rolled out of his bed and experiencing a great strange shock were simultaneous. He and his men had a dreadful, indescribable, but momentary sensation, which was followed immediately by a rush of dust-laden air filling the dug-out. A huge shell had dropped and exploded above them quite close to the mouth of the ventilating shaft.

It seems evident that these men survived because, having an inlet to the dug-out their atmosphere was not entirely taken from them, but evidently nearly so, as indicated by the succeeding downrush.

The man with the telephone receiver in hand assuredly died because his atmosphere was suddenly taken from him.

Long before this war ends there must be more instances of this kind; and for physiological as well as pathological reasons it would seem important that *post-mortem* examination be made in order to clear up the causation of these strange happenings, which recall the classical experiment of the mouse and the air-pump.—I am, etc.,

J. LEWIS THOMAS, M.D., D.P.H.

Newport (Mon.), April 21st.

THE TREATMENT OF FRACTURES.

SIR,—From what Mr. C. H. Fagge writes in his letter in the BRITISH MEDICAL JOURNAL of April 28th, it is evident that he has misunderstood my meaning. It is not easy to express exactly what we mean by such terms as "perfect" and "good" and "bad" anatomical results. By a "perfect" anatomical result I mean such a result as would show in a skiagram with perfect alignment and no overlapping at all; and I feel sure most surgeons would agree that, as regards the overlapping, such a result was exceedingly unlikely to be obtained without operation, and very likely not even then. In connexion with the definition of a perfect anatomical result, I should like to call attention to an experience described by Mr. Robert Jones.[1] A patient called to see him with a skiagram showing slight overlapping in the union of a fractured tibia a year after the accident. He had climbed the Schilthorn since the union of the fracture, but he was so horrified at finding the overlapping in the skiagram that he came to Mr. Jones prepared to have it corrected by operation, attributing vague pains he could remember having had in the leg to it. Here was an instance of a result which was quite good for practical purposes, but could not be called with complete accuracy a perfect anatomical result.

All surgeons might agree with the conclusion of the Fractures Committee that the best way to obtain a good functional result was to secure a good anatomical one (not that a good functional result will invariably follow), and yet they might all have a different standard of how good that anatomical result should be. They must admit that it will not be perfect, and are agreed that, as I said in my paper, gross deformity must be corrected, but there would be much difference of opinion as to how much overlapping was permissible, if alignment were good. Accepting the conclusion of the Fractures Committee, one surgeon might consider the rectification of displacement in any particular fracture, as shown by a two plane skiagram, was good enough and another might not.

Mr. Fagge is very much mistaken if he thinks I undervalue the need of correcting the displacement. Indeed I urged in my paper that the neighbouring joints should not be moved in order that a correct position of the fragments should not be disturbed. But I do not accept all the conclusions of the Fractures Committee (of which Mr. Fagge was a member), some of which seem to me to

[1] BRITISH MEDICAL JOURNAL, 1912, vol. ii, p. 1594.

go too far in this matter. The Committee advocated operation on all simple fractures—certainly not very strongly, but that was the general trend of their conclusions[2]—and that operation is necessary in all simple fractures I do not believe.

Mr. Fagge says what I have written is "bad doctrine," and "will mislead readers to be satisfied with results which fall short of the best." If by the best he means such perfect anatomical position of the fragments as I have above described, and which he apparently thinks an endeavour should always be made to obtain by operation, then I must say I would urge that this is unnecessary. But I consider that every means should be taken, by reduction under an anaesthetic, the employment of adequate weight extension, and careful splinting, to overcome displacement and to maintain the improved position. And our result must be carefully judged by a two plane skiagram. If we cannot succeed by these means, then in most cases I think we must operate, but I should certainly try such measures first.

Mr. Fagge says he regards my statement that the screws inserted into living bone tend to get loose as a fallacy which dies hard. It is certainly not dead yet, and I should like to point out what I hope may even revive it in the minds of the sceptical. Mr. Fagge says when we find the screws loose it is always the result of sepsis causing a rarefying osteitis around them. Certainly it is in cases with some degree of sepsis—perhaps a very slight degree—that we usually remove the screws. If there is no sinus formation we rarely interfere with them. But I should require evidence from Mr. Fagge that that sepsis, which may be, as I say, only very slight, loosened the screws by causing rarefying osteitis around them, or in any other way, before I accepted his view. Indeed, I have evidence that the screw may become loose without any sepsis, however slight. I operated on an ununited fracture of the humerus a few years ago, and screwed the ends of the bones together. There was never any sepsis, early or late, but union of the bone did not take place, and I operated again three months later. Not only was the screw quite loose, but I remarked in my notes of the operation, made at the time, "the channel of the screw was much enlarged from absorption of bone around the screw." I do not believe it is rarefying osteitis from sepsis that loosens the majority of the screws, but that it is a pressure atrophy which may be present apart from any sepsis. This loosening process around portions of metal inserted into living bone has been described by Sir William Macewen in his book on the growth of bone (p. 21). He says: "A pin driven into the diaphysis so that it is firmly caught, will in the course of a few days become loose owing to the softening which the mechanical stimulation has set up in its periphery. The greater the pressure, the greater the area of softening."—I am, etc.,

Bristol, April 29th. CHARLES A. MORTON.

THE DANGER OF SMALL-POX.

SIR,—Dr. Millard's rejoinder in your issue of April 21st hardly requires any lengthened reply from me. I am quite ready to accept his oft-repeated assurance that he is not an antivaccinist. But I trust he will pardon me if I call him a very weak-kneed vaccinist! Listen to his words in your issue of March 24th:

> Germany, the much vaccinated and revaccinated Germany, which for years has been held up as a shining pattern to the world in the matter of vaccination, is now suffering from "several serious outbreaks of small-pox" . . . Surely it is time that existing theories about vaccination were re-examined.

These are undoubtedly the words of one who desires that vaccination should be "weighed in the balance and found wanting." Again, in his last letter, referring to the remarkable Irish statistics which I gave, all he will admit is that "vaccination must *at first* have produced a very real effect" and "*greatly accelerated* the tendency to decline which had already set in." (The italics are mine.) I submit that these words are an admission of the value of vaccination, but they are a grudging admission. Dr. Millard is reluctant to admit the value of vaccination—he regards the operation as a *pis aller*. In common with the vast majority of our profession, I look upon it as our sheet-anchor against small-pox, and can see no sufficient reason why it should not continue to be compulsory in infancy and be repeated after the lapse of five or seven years. This difference of mental attitude it is that really separates Dr. Millard's position from mine, and it seems as though no argument were likely to alter it.

Dr. Millard sees in possible errors of diagnosis in modified cases a reason for abandoning the compulsory vaccination of infants. I should prefer to see none but modified cases, or—as would happen were my programme carried out—no cases at all. Dr. Millard places his reliance on general sanitary measures and calls in the aid of vaccination only when he cannot help it. I, whilst perfectly willing to adopt the latest administrative developments, am apprehensive that in a sudden emergency, such as the outbreak of small-pox in the midst of an unvaccinated population, these methods might break down. I prefer the well-tried buckler which Dr. Millard would discard—or try to pick up when already at close quarters with the foe. With regard to what happened at Leicester and elsewhere, it seems useless chopping logic. The main fact is that in vaccination we possess an admittedly certain means of defence, and Dr. Millard will not have it compulsorily adopted. On the contrary, by his attitude, he encourages (I should hope, unconsciously) the fanatical antivaccinists to persist in their unreasonable prejudice, and thus help to throw open the door through which "one of our rarest zymotics" may yet stalk in.—I am, etc.,

E. J. MCWEENEY.

Pathological Department, University College, Dublin, April 30th.

EFFICACY OF APPLICATIONS FOR THE PREVENTION OF VENEREAL DISEASES.

SIR,—It seems opportune to revert to the original point at issue—namely, the efficacy of certain local applications in preventing the development of syphilis and gonorrhoea. In 1906 Metchnikoff and Roux, after the failure of their attempts to obtain an attenuated virus for prophylactic purposes against syphilis, tried the preventive effect of the local application of a 33 per cent. ointment of calomel to the point of inoculation of the syphilitic virus. They found that this procedure prevented the development of the chancre in the macacus monkey when rubbed in an hour after inoculation. The experiment was then tried on the human subject, a medical student whose personal and family history were guaranteed free from syphilis. Neither chancre nor secondary symptoms developed; but a macacus monkey inoculated from the same virus and not treated with the calomel ointment developed a chancre in due course. Metchnikoff, therefore, assumed that the application of calomel ointment to the point of inoculation of syphilitic virus within an hour would prevent the development of syphilis.

These experiments were repeated on monkeys by Neisser, but the results were not always successful; for in some cases a chancre developed. Since then this procedure has been adopted by several navies, and more recently by armies, with a view to diminish the incidence of syphilis. Prophylactic measures against gonorrhoea, by instillation of protargol and other solutions, have been used at the same time. The method adopted in Australia[1] consists in the instillation of a 20 per cent. solution of argyrol within the urethra, and inunction of calomel ointment 30 per cent. to the whole penis. It has occurred to me that these preparations might be improved upon. In the first place, protargol and argyrol—two of the multitude of preparations produced by the enterprising and commercial German chemists—are inferior to the permanganates in gonococcidal action. They are also much more expensive. A solution of potassium permanganate (1 in 1,000) is therefore to be preferred. A solution of mercury biniodide 1 in 1,000 is also good. Secondly, as regards the ointment, calomel is vastly inferior in bactericidal action to mercury perchloride. It also has the disadvantage of being in suspension in the ointment instead of in solution, and naturally these agents act more rapidly and more effectively in a state of solution. Now mercury perchloride can be made into an ointment when dissolved in glycerine. A suitable ointment consists of 1 grain of perchloride, 1 drachm of glycerine, to 1 ounce of lanoline. This contains approximately 1 in 500 of mercury per-

[2] BRITISH MEDICAL JOURNAL, 1912, vol. ii, p. 1505.

[1] Lieut.-Colonel J. W. Barrett, *Lancet*, March 17th, 1917.

chloride, strong enough for bactericidal action, but not strong enough to cause much irritation.

As regards the efficacy of these prophylactic measures (a better term would perhaps be "abortive") it is a mistake to place too much reliance on them in actual practice, at any rate in the case of syphilis, for the point of inoculation is not known as it is in experimental inoculation. It is obvious that mercurial ointment applied to the penis will not prevent the development of a chancre of the lip. However, as the great majority of chancres occur on the penis, such measures are certainly worth trying.

Some correspondents appear to have an exaggerated idea of the value of these preventive measures, Mr. Hugh Elliot, for example, referring to them as "the means of preventing and abolishing syphilis."[2] Metchnikoff's ointment was introduced more than ten years ago, yet the pale spirochaete still pursues its evil course. It is well that the public should understand that, although the incidence of syphilis may be appreciably diminished by the widespread use of these local applications, it is Utopian to imagine that they will abolish syphilis from the face of the earth.—I am, etc.,

C. F. MARSHALL.

Military Hospital, Prees Heath, April 17th.

CHILD MORTALITY.

SIR,—At no time in the history of the British empire has the value of infant life as an asset of the State risen to the height that it is now doing, chiefly on account of the ravages of this dastardly war, mendaciously and stealthily provoked, but partly also on account of our steadily and regretfully declining birth-rate, a declension which has been in evidence for nearly a quarter of a century, and which is quite independent of our war conditions.

It is, of course, not feasible for the State to cause an increase in infant life, but it nevertheless can do much, and it is its bounden duty to do everything possible to preserve infant life with which it is presented.

In the JOURNAL of April 21st, in your leading article dealing with the recent report on child mortality emanating from the Local Government Board, you make pointed reference to the high hopes entertained by that Board of effecting a speedy and mighty reduction in our present lamentable infant mortality. Those hopes are expressed in the following terms: "In every area a very high proportion of the total present mortality could be obviated, and it is well within the range of administrative action to reduce the child mortality within the next few years to one half of its present amount." All who scan carefully the recent circulars and memoranda issued by the Local Government Board to local authorities on the question of child welfare must be extremely sceptical of the great results which are likely to be attained through the "administrative action" therein portrayed, and will readily subscribe to your statement that "there is, we fear, hardly a remote probability that anything like this saving of 70,000 children a year will be effected within the next few years." In the closing sentence of your article you very pithily remark, "even the measures that are now advocated and supported by grants are in many respects little more than tinkering with the problem," and this undoubtedly is the true position of affairs.—I am, etc.,

London, W., April 23rd. JAMES OLIVER, M.D., F.R.S.Edin.

GLYCERINE IN DISPENSING.

SIR,—When a chemist is asked to dispense a prescription containing an ingredient which he has not and cannot obtain, his duty, far from not being clear, is clearness itself, and no amount of economic conditions obscures it. He should inform the patient or the prescriber, or both, that the prescription cannot be dispensed for the reason stated; of course, in the case of an *error* in the prescription, the prescriber only should be informed.

In view of the fact that recently an insurance committee seriously made the preposterous suggestion that chemists should be instructed to omit glycerine and its preparations from prescriptions containing them, it may be well to point out that the chemist would be liable to an action at law for so tampering with a prescription, and a defence based on the committee's "instruction" would no more avail than a defence of pocket-picking or assault on the same ground.

Doctors are aware of the shortage of glycerine, and that it has practically no medicinal value, so that if they are so foolish and inconsiderate as to go on prescribing it, the way to bring them to reason will be the returning of the prescription, when the delay and the extra trouble of again seeing the patient and altering the prescription will probably be effectual. As a matter of fact there is very little glycerine or its preparations being prescribed at present, as an examination of the panel prescriptions sent in demonstrates.

In any case it cannot be too widely known that no one but the prescriber can authorize a dispenser to alter a prescription, and if without such authority a dispenser interferes with the formula he may find himself in a very unpleasant predicament. He certainly will if I am the prescriber.—I am, etc.,

London, S.E., April 29th. C. H. PRING.

*** With regard to the use of glycerine substitutes, Messrs. Squire and Sons, Ltd., inform us that they have recently examined two glycerine substitutes now on the market. One consisted of a solution of glucose about the same specific gravity as simple syrup, and the other of mucilage of tragacanth preserved with chloroform water. Glycerine is used in prescriptions (apart from its sweetening effect) partly to give viscosity, so that the solution shall cling to the mucous surfaces, and in lotions to prevent them drying too quickly. Either of the substitutes examined would give viscosity and would also retard evaporation, but the final effect on the skin would be very different. Glycerine is also used as a solvent and as a preservative, and for both these purposes could only be replaced by alcohol. Glycerine has also an osmotic effect as in cataplasma kaolini (*U.S.P.*), and cannot in this respect be replaced by any known substitute.

THE OLDEST AGE OF PARTURITION.

SIR,—The following case may be of interest to your readers. M. H., born March 10th, 1846, in the parish of B., and certified by Mr. Thomas Roberts, superintendent registrar, for the purpose of old age pension, which certificate I saw to-day, has had nine children; four are living; the youngest was born October 19th, 1895. He is in good health, and 5 ft. 11½ in. in height, but failed to pass into the army. The mother of M. H. died at the age of 98. M. H. is hale and hearty. Her husband died about twelve years ago of pneumonia; he had small-pox in his younger days. He was of moderate build and size.

M. H. was therefore 49 years and 7 months old when her youngest child was born. She ceased to menstruate at the age of 54.—I am, etc.,

R. OWEN,
Penygroes, N. Wales, April 3rd. District Medical Officer.

Universities and Colleges.

UNIVERSITY OF GLASGOW.

THE Arnott prize of £25 in physiological physics has been awarded to Mr. John Kirk, M.A., B.Sc., and the Bellahouston gold medal for eminent merit in the thesis for M.D. to Dr. Thomas Walmsley. The George Roger Muirhead prize of £2 5s. for chemistry has been won by Messrs. J. Shulman and J. Wilson, who were equal; Mr. W. Napier has been awarded the special prize in laryngology and rhinology.

UNIVERSITY OF EDINBURGH.

THE Business Committee presented a report to the meeting of the General Council of the University of Edinburgh on May 2nd, recommending draft ordinances for the foundation of chairs of French and of Medical Chemistry. The institution of the latter chair is welcomed as a most important step towards strengthening the faculties both of medicine and science. It is recommended that the endowment of the chair should be £15,500 and the salary of the professor not less than £1,000 a year. The adoption of a draft ordinance instituting a degree in commerce was also recommended.

Interim reports were presented on the general question of the development of the university after the war. The foundation of a central research fund, to be drawn upon to aid individual researches, was advised. It would be necessary to secure co-operation between manufacturers and the universities, and a beginning, it was suggested, might be made by the university offering to attempt the solution of problems presented to it by manufacturers under conditions of confidential treatment and

[2] BRITISH MEDICAL JOURNAL, February 24th.

remuneration, details of which could only be determined by the circumstances of each particular case,

A subcommittee advised that the University Court should be asked to call a conference of the Royal Colleges of Physicians and Surgeons, the School of Medicine (extra-mural) of the Royal Colleges, and the Edinburgh Dental School dependent upon it, to consider the future position of the schools and their relation to the university.

THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

An ordinary comitia was held at the Royal College of Physicians of London on April 26th, the President, Dr. Frederick Taylor, being in the chair.

Licentiates.

Licences to practise physic were granted to 101 candidates who had passed the required examination.

Election of Fellows.

The following gentlemen nominated by the Council were elected to the Fellowship of the College: Dr. Robert Henry Cole, Dr. David Nunes Nabarro, Dr. Henry Willoughby Gardiner, Dr. John Telfer Calvert, Dr. Reginald Henry Miller, Dr. Carey Franklin Coombs, Dr. Percy Whittington Saunders, Dr. Wm. Errington Hume, Dr. Henry MacCormac, Dr. Charles Joseph Singer, Dr. Edward Palmer Poulton.

Proposed Suspension of Systematic Lectures.

The following communication from the Committee of Reference was referred to the Committee of Management for consideration and report: "That in consequence of (1) the depletion of the staffs of the hospitals and medical schools; (2) the reduction in the number of students; (3) the amount of time necessarily devoted by students in their fourth and fifth years to practical clinical work owing to the shortage of resident medical officers—the Royal Colleges of Physicians and Surgeons be requested to consider the desirability of suspending, during the period of the war, the regulations that students should attend systematic courses of lectures."

Proposed Inter-Allies Conference on Spas.

It was resolved to inform the Local Government Board that the College considers that it is advisable that His Majesty's Government should send a delegate to the proposed conference after the war, for the improvement of spas, etc., in the Entente countries, should such conference be held, and that the College would be glad, if it were desired in the future, to advise as to the selection of such a delegate.

Recognition of Schools.

On the recommendation of the Committee of Management the following institutions, already recognized for instruction in Chemistry and Physics, were recognized also for instruction in Biology: Cranleigh School; the Intermediate School, Pontypridd.

CONJOINT BOARD IN SCOTLAND.

The following candidates have passed the final examination: Mary G. Jones, R. Austin, S. S. Barton, R. L. Bellamy, A. B. MacDougall, A. B. Black, W. Brown, N. S. Bruce, L. W. Hughes, E. G. Jones, R. G. Battersby, J. J. Mulvey, Don Adrian Jayasinghe, R. N. Burton.

Obituary.

SIR MARC ARMAND RUFFER, C.M.G., M.A., M.D.Oxon.,

PRESIDENT OF THE SANITARY, MARITIME, AND QUARANTINE COUNCIL OF EGYPT.

We regret to record the death of Sir Armand Ruffer, the distinguished President of the Egyptian Sanitary and Quarantine Council, and one of the principal authorities on all matters relating to public health in Egypt. Marc Armand Ruffer was born in Paris in 1859, the son of Baron Alphonse Jacque de Ruffer. He was educated at Brasenose College, Oxford, where he graduated B.A. in 1883, and at University College, London. He took the degrees of M.B., Ch.B. in 1887 and proceeded to the M.D. two years later. From this time onwards he devoted a considerable share of his energies to research in bacteriology and pathology, and was a frequent contributor to these columns, scarcely a volume appearing without some record of original work from his pen.

For a time he was director of the British Institute of Preventive Medicine, which was then struggling for existence, and there is no doubt that his scientific habit of mind, wide reading, technical skill, and strong personal character, did much to lay well and truly the foundations of the Lister Institute of to-day. At that time he was well known in medical London and exercised a great influence over the men of his own generation. He was not a man of many words, but when his burly form rose and his voice, with its characteristic burr, was heard, men listened, for they knew that he would have something to say which would be based on personal experience and knowledge of what had been done in other countries. He seemed to have a great future before him as an exponent of bacteriology and pathology in this country when, much to the surprise of the majority of his friends, he accepted in 1896 the post of professor of bacteriology in the Cairo Medical School. In 1901 he became president of the Sanitary, Maritime and Quarantine Council of Egypt, which has its head quarters at Alexandria. That post he retained until his death, discharging its duties with wisdom and success. When he first took office, and for many years afterwards, Egypt was annually threatened by epidemics of cholera, introduced by the returning pilgrims, and the prevention of the disease was the greatest problem he had to solve. It was only solved by constant vigilance, by thorough organization, and by the exercise of arts of diplomacy which those who knew Ruffer in his early days hardly supposed him to possess.

While doing this important administrative work he continued his laboratory investigations and also undertook various public duties; thus he was a member of the Indian Plague Commission, Egyptian delegate to the sanitary conferences of 1903 and 1911 in Paris, and of 1907 in Rome, and the representative of Egypt at the International Bureau of Hygiene in Paris. Other activities of a very busy life included the presidency of the Alexandria municipal delegation, and for a while the post of Commissioner to the British Red Cross Society and Order of St. John. His services to science, and to Egypt, were publicly recognized on many occasions. His foreign honours included the Grand Cross of the Medjidieh; Grand Officer of the Osmanieh; Commander of the Order of Saviour of Greece; Commander of the Order of St. Anne of Russia; the Cross of Italy; and Officer of the Legion of Honour. The C.M.G. was conferred upon him in 1905, and a knighthood in 1916. The *Times* correspondent at Cairo states that his death occurred on the way back from Salonika where he had been engaged in the reorganization of the sanitary service of the provisional government of Greece. During recent years he took an increasing interest in archaeological matters, and published a number of papers upon subjects connected with the anthropology of ancient Egypt.

HENRY HETLEY, M.D.Lond., J.P.,

UPPER NORWOOD.

We regret to record the death on April 13th of Dr. Henry Hetley of Upper Norwood. He was born in 1851 and educated at King's College, London, and Guy's Hospital. He had a brilliant student career. He held the resident appointments at Guy's Hospital of house-physician, house-surgeon, and resident obstetric officer, after which he was house-surgeon at Leicester Infirmary and medical officer to St. Luke's and the London Fever Hospitals. In 1878 he became partner to his uncle, the late Dr. Frederic Hetley, J.P., D.L., whom later he succeeded. During his forty years of medical practice in the neighbourhood, Hetley, by his strong personality and force of character, became the recognized leader of the medical profession in the district round about the Crystal Palace. In addition to building up a great general practice, he also acted as surgeon to the Norwood Cottage Hospital for thirty-five years, keeping abreast of the developments of surgery during that period.

In the medical activities of the district he always played a prominent part. He was the leading spirit in the Sydenham District Medical Society, in which he held office first as secretary and later as treasurer for a period of thirty-four years, and to his firmness and kindly wisdom the society largely owes its traditions, which have made it both successful and powerful. For many years also Hetley did good and useful work for the British Medical Association, holding the positions of chairman of the old Norwood Division and also of president of the South-Eastern Branch. His presidential address at the annual meeting of the latter upon some of the amenities of general practice will long be remembered by those present for its pungent wit and genial sarcasm.

The Surrey Benevolent Society is also greatly indebted to Hetley for his valuable services as treasurer for some years past. But his abundant energies were not exhausted by his medical work, public and private. His shrewd knowledge of men and kindly sympathy soon gave him a leading position on the Croydon Bench. Moreover, on the outbreak of war he threw himself with all his old energy into every useful movement organized in Croydon or

Upper Norwood, and when the Croydon War Hospital was opened he was appointed senior physician at the Davidson Road Division. Such additional strenuous work was too much for him; early in the year he had a severe attack of influenza and bronchitis, and later when a dangerous internal malady was discovered he failed to recover from the necessary radical operation. His loss is deeply felt not only by his immediate circle of friends but also by the poor of the neighbourhood, to whom he freely gave his services at all times.

THE death of Dr. L. K. H. HACKMAN, of Portsmouth, announced in the JOURNAL of April 7th, was due, we have since learnt, to epidemic cerebro-spinal meningitis, no doubt contracted in the discharge of his duties as a civil medical practitioner attending military patients at the Reception Hospital and elsewhere. Dr. Leon, of Portsmouth, died nearly a year ago of the same disease, contracted apparently in the same way. Dr. Hackman became honorary secretary of the Portsmouth Division on the death of Dr. Mumby, but before that he had been for many years a constant attendant at meetings, and an active participant in every measure calculated to benefit the profession. This was especially illustrated by his work in connexion with the Insurance Act, which gave such satisfaction to his medical brethren that they raised a testimonial and presented him with a flower bowl and a cheque. On more than one occasion he represented the Division on the Representative Body; he also served on the Panel Committee and the Medical Service Subcommittee, and was the secretary of the local Medical War Committee. He served also on the Branch Council both as one of the Portsmouth elected representatives and as an *ex officio* member, by virtue of his holding the office of honorary secretary of the Division; Dr. Bodington, now president of the Br. nch, writes: "He always impressed me with his special knowledge of official affairs; he will be a great loss to the British Medical Association, apart from the personal loss to his many friends." He had the happiest of home lives; he had thirteen children, of whom ten reached adolescence; nine of them were boys, and six joined the army when war broke out. One was reported missing after Neuve Chapelle and was never again heard of; but his father bore this great sorrow with characteristic courage, and worked even more devotedly than ever. The funeral took place on March 26th, when over fifty medical men of the town and district, military and civil, were present. Dr. Ward Cousins, the senior member of the profession in the district, was prevented from attending by slight indisposition. The funeral was also attended by representatives of the St. John Ambulance, of the Philharmonic Society, of the Parish Church, and of the Ruridecanal Society, with all of which Dr. Hackman was connected.

DR. CHARLES S. BRADDOCK, who died at Haddonfield, New Jersey, on March 25th, at the age of 53, was born in 1863 and took his degree at the Jefferson Medical College in 1896. He served in a cruiser in the Spanish-American war, and afterwards practised for some years in his native place. In 1901 he was appointed chief medical inspector of the Royal Siamese Government and fought indefatigably for the sanitary betterment of that kingdom. One of his last acts in Siam was to draw up the code of health laws now in force there.

The Services.

INDIAN MEDICAL SERVICE.

THE Secretary of State for India again gives notice that applications for appointment by nomination to the Indian Medical Service should be addressed to the Military Department, India Office, Whitehall, S.W.1. Applicants must be over 21 and under 32 years of age; the appointments are made on the recommendation of a Selection Committee.

EXCHANGE.

Temporary Captain R.A.M.C., age 27, desires to exchange with Temporary Surgeon, R.N.—Address No. 1450, BRITISH MEDICAL JOURNAL Office, 429, Strand.

Medical News.

A STATUE of Berthelot, the great organic chemist and the founder of thermo-chemistry, will be unveiled this month in the gardens of the Collège de France. He did much of his work in the laboratories of the college.

THE Sydney Ringer biennial memorial lecture will be delivered on Friday, May 25th, in the lecture theatre of University College Hospital Medical School at 4 p.m., by Professor A. R. Cushny. The subject is digitalis and auricular fibrillation.

A QUARTERLY meeting of the Medico-Psychological Association of Great Britain and Ireland will be held on Tuesday, May 15th, at 11, Chandos Street, Cavendish Square, at 3 p.m., when Dr. R. H. Steen will read a paper on hallucinations in the sane.

THE Home Secretary has extended the permission to persons bona fide engaged in the practice of dentistry, but not registered, to purchase preparations containing not more than 1 per cent. of cocaine for use as local anæsthetics in dental work until July 31st next.

A REUTER telegram from Petrograd states that a conference of delegates of medical officers of the army and navy has adopted a resolution in favour of the immediate mobilization of doctors of both sexes to meet the needs of the army and the country.

THE Army Council has notified its intention to take possession of all stocks of quinine, phenacetin, and formaldehyde. The order will not apply to firms holding stocks of less than 100 oz. of quinine sulphate, or 25 oz. of quinine bisulphate, quinine hydrochloride, or quinine bi-hydrochloride, or 7 lb. of phenacetin, or 10 gallons of formaldehyde solution 40 per cent. Pending receipt of instructions firms may deal with the quantities of their stocks mentioned above.

A RECEPTION by the President and Council of the West London Medico-Chirurgical Society will be held at the West London Hospital, on Wednesday, May 23rd, at 8.30 p.m. A musical entertainment will be provided, and the West London Medal will be presented to Fleet Surgeon Francis Bolster, M.D., and Major Harold Edgar Priestly, R.A.M.C., for exceptional heroism in the discharge of medical duties. Applications for tickets, price 5s. each, should be addressed to Dr. Reginald Morton, 66, Harley Street, W. The whole of the proceeds will be given to the Officers' Families Fund, to be specially devoted to the families of officers of the Royal Army Medical Corps.

THE President of the Board of Agriculture has appointed a committee to consider the question of the production and distribution of milk, with Major Waldorf Astor, M.P., as chairman. Among the members are Major Gerald R. Leighton, M.D., Inspector of Abattoirs and Dairies to the Scottish Local Government Board, and Mr. A. W. J. McFadden, C.B., M.B., Chief Inspector of Foods to the Local Government Board of England and Wales. Communications may be addressed to the Secretary of the Committee, Mr. J. Mackintosh, at the Food Production Department, Board of Agriculture, 72, Victoria Street, S.W.1.

THE Triennial Prize of the Royal College of Surgeons of England, consisting of the John Hunter medal in gold to the value of fifty guineas, or, at the option of the author, a medal executed in bronze, with an honorarium of £50, will next be awarded for the best essay on "The development of the hip-joint and the knee joint of man." Essays must be received at the college not later than Tuesday, December 31st, 1918. The subject of the Jacksonian prize for this year, essays in competition for which must be received on December 31st, 1917, is "The causation, diagnosis and treatment of traumatic aneurysm, including arterio-venous aneurysm." As already announced, the subject of the prize for 1918 is "Injuries and diseases of the pancreas and their surgical treatment."

AN inter-Allies conference for the study of the industrial re-education of disabled soldiers will be held from May 8th to the 12th, 1917, in Paris at the Grand Palais. The programme includes discussions on physical re-education, industrial re-educational establishments, and labour bureaux; the social and economic interests of disabled soldiers; and the care of the blind and deaf, and sufferers from grave central nervous lesions. The opening session will be presided over by the President of the French Republic. The presidents of the Franco-Belgian Committee of Organization are Baron de Broqueville, Belgian Minister for War, M. Léon Bourgeois, M. Justin Godart, and M. Roden. An Anglo-Belgian Committee for re-education has been formed, with offices at 6, Burlington Gardens, London, W.

Letters, Notes, and Answers.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY. *Medisecra, Westrand London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

ANSWERS.

E. L. B.—The most suitable institutions for an epileptic boy, aged 12, would be the Epileptic Colony at Chalfont, Bucks, which has special schools for children, or the David Lewis Epileptic Colony, Sandlebridge, Alderley Edge (apply to the medical superintendent); our correspondent might communicate with Mr. G. Penn Gaskell, who is secretary both of the Epileptic Colony at Chalfont and of the National Society for Epileptics, Denison House, Vauxhall Bridge Road, London, S.W.

ACNE.

CAPTAIN, R.A.M.C., writes, in reply to "R." (April 21st, p. 532): Use plenty of hot water to the face and wash it night and morning with a mixture of equal parts of sapo mollis and sp. vini rect., and afterwards paint on with a camel hair brush lotio calaminae and allow it to dry on. I suffered from chronic acne for some years and after trying almost everything found the above the only remedy of any value.

MR. R. JOCELYN SWAN (Wallington) suggests the following reply to "R.": Let the child's face be well washed at bedtime, and some of the lotion mentioned below dabbed on with a sponge and allowed to dry on. In the morning let the adhering powder be lightly removed with a soft towel (no washing).

℞ Lac sulphuris ... ... ʒij
Zinci oxid. } ... ... āā ʒj
Lapis calamin. }
Glycerine ... ... ʒj
Aq., q.s. to the consistency of cream (about ʒiv)
M. Ft. lotio.

THYMOL MOUTH WASHES.

B. G. W.—When thymol is given in large doses—for example, from ½ gram to 2 grams (30 grains) in solid form as an anthelmintic—it is certainly necessary to exclude all good solvents of the drug (oils, alcohol, etc.) from the dietary, in case these large amounts should be absorbed. The thymol, referred to as harmless, in the paper on mouth-washes (BRITISH MEDICAL JOURNAL, April 14th, 1917, p. 474) is the minute amount present in aqueous solutions and liable to be accidentally swallowed during use as a gargle.

The *British Pharmaceutical Codex* contains a formula for compound glycerine and thymol for use as an antiseptic and anticatarrhal wash, to be applied, diluted with two to five parts of water, as a spray to the throat and nose, or used as a nasal wash in a glass irrigator. It contains in addition to a number of other ingredients 4½ grains thymol in 20 fluid ounces.

LETTERS, NOTES, ETC.

PETROL DUTY REBATE.

WE are informed that the Petrol Control Committee refuses to accept the contention advanced in the note published in the JOURNAL of April 21st, p. 532, to the effect that the rebate on petrol duty to which medical men are entitled is 4½d. The contention of the Petrol Control Committee is that the licence duty of 3d. per gallon payable to it is an additional duty on which no rebate can be claimed, and has no connexion with the price charged by retailers. It is held that the total amount that can be claimed is 3d. a gallon off the duty payable to retailers.

SURVIVAL IN SPINA BIFIDA.

MR. JOHN GAY, medical officer to the Royal Hospital for Incurables, Putney Heath, S.W., informs us that there has just died in that institution a woman, aged 53, the subject of spina bifida. The tumour was very large and entirely covered with skin; she had incontinence, and the legs being paralysed and curiously contracted, she had lain for a good many years on the abdomen and chest. Survival to this age must, Mr. Gay thinks, be very uncommon.

SHOCK FOLLOWING INTRAVENOUS INJECTIONS OF CHEMIO-THERAPEUTIC PRODUCTS.

DR. G. ARBOUR STEPHENS (Swansea) writes: An experiment described in my article on colloids in physiology and pathology in the *Practitioner* for September, 1910, may have some bearing on the statements in Mr. McDonagh's letter on shock. It is as follows: When pure H_2O_2 is added to clean mercury bubbles of oxygen are given off with pulse-like regularity, the mercury remaining unchanged. When, however, the mercury is shaken up with a solution of calcium chloride and drained, previous to the addition of the H_2O_2, the reaction is altogether different; a violent disturbance takes place, the test tube gets quite hot, and the mercury is churned up into a dull grey mass, whilst some of it becomes colloidal.

PROMOTION OF TEMPORARY R.A.M.C. OFFICERS.

IN reply to the suggestion of "Temporary Captain R.A.M.C." printed in our issue of February 17th, p. 248, that temporary officers of his standing should be promoted to the rank of major upon completion of two years' service, we have received several communications. We select the following as they represent three different points of view:

CAPTAIN R.A.M.C. SPECIAL RESERVE writes from his experience of seven years' service to point out to his brother officers with temporary captaincies that if they were in the Special Reserve the normal period before attaining the rank of major would be eleven years.

MAJOR draws our previous correspondent's attention to the fact that there are in the R.A.M.C. Territorial Force a number of majors, with the highest medical qualifications and over twenty years' continuous service, who have qualified by examination for the rank of lieutenant-colonel, but who are unable to obtain promotion.

Another correspondent, a temporary captain in the R.A.M.C., writing in support of the proposal if feasible, expresses the feeling that the arduous work of medical officers who have served in base hospitals and clearing stations for two years or more has met with little individual acknowledgement. He makes the point that relatively to the size of the corps the R.A.M.C. shows at present a small number of officers of field rank, compared with, say, the R.F.C. or the A.S.C. He feels sure from his own experience of the treatment of temporary officers by the authorities that the suggestion would be considered in a sympathetic spirit.

It is probable that the War Office would strongly oppose on various grounds the automatic promotion to field rank of temporary officers at the conclusion of two years' service. But a strong case might be made out for the promotion of those temporary officers of more than two years' standing who hold such responsible posts as officer in charge of division, registrar or surgical specialist, to the acting rank of major; and we believe this has already been advised by commanding officers of medical units and other military authorities who recognize the desirability of such a course on the score of efficiency as well as of justice to individuals.

PROFESSIONAL STATUS AND MILITARY RANK.

M.R.C.P. writes to suggest that army rank should be given to medical men "according to their seniority in the profession in conjunction with the degrees and diplomas they hold." Unfortunately no one has yet been able to devise a workable scheme for grading degrees and diplomas, or even seniority in the sense implied by our correspondent. M.R.C.P. maintains further that the army custom whereby officers sign their names to the findings of a medical board in order of rank, and civilian practitioners sign after commissioned officers, "subordinates" the civilian when he is of higher professional standing than his colleagues on the medical board. We scarcely agree that this is the effect, and we do not share our correspondent's objection to making the most senior regular officer, with his administrative experience, president of a medical board, since the highest technical authority does not always make the best chairman.

It is generally admitted that the present method of giving military rank to civilian surgeons is far from ideal. There are many hardships and annoyances, but so far as we know nearly all temporary officers, and partly employed civilian practitioners, take the sensible and patriotic view, and recognize the impossibility of any satisfactory gradation of military rank in accordance with age, professional status, appointments, qualifications, and so on. In particular, we deprecate this correspondent's suggestion that the self-styled consultant or specialist, no matter how many his degrees and diplomas, is necessarily of higher professional standing than the general practitioner, and therefore to be given superior army rank as a matter of course.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Seven lines and under	0 5 0
Each additional line	0 0 8
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An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.